RAILROAD GAZETTE

FRIDAY, OCTOBER 4, 1895.

CONTENTS

ILLUSTRATIONS: PAGE.
The Sixteenth Street Lift Bridge, Milwaukee.... 649
The La Burt Underground Conduit..... 654
More Bent Rails 655
A Pair of Big Cast-Steel Couplers..... 655
A Pneumatic Blow-off Cock..... 655

CONTRIBUTIONS:
Mile Posts..... 649
The Condition of the Topeka, St. Louis & Kansas City..... 649
A Broken Axle and a Bridge Wreck..... 649

EDITORIALS:
Some of the Hidden Matters in Car Repair and Fuel Accounts.. 657
The Baltimore Tunnel Electric Locomotive in Service..... 657
Prosecutions Under the Labor Laws..... 657
The Man who Harnessed Niagara 658
Annual Reports..... 658
August Accidents..... 658

EDITORIAL NOTES.....656, 659
New Publications..... 659
Trade Catalogues..... 659

GENERAL NEWS:
Car Building..... 661
Bridge Building 661
Meetings and Announcements..... 662
Personal..... 662
Elections and Appointments..... 663
Railroad Construction... 663
General Railroad News.. 663
Traffic..... 664

MISCELLANEOUS:
Technical..... 659
The Scrap Heap..... 660
System and Precision in Block Signaling..... 649
The Race to Aberdeen.. 651
The Deep Waterways Convention..... 652
Train Accidents in the United States in August..... 651
The Influence of Vibration on Steel..... 655
Bridge Deflections 655

Contributions.

Mile Posts.

CHICAGO, Sept. 20, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In traveling around I notice that more and more railroads are putting mile posts along their tracks. The traveling public seems to be greatly interested in them and they contribute to intelligence. In putting up new posts or in repainting old ones I would respectfully suggest the following form:

Graduating the figures and making the unit figure the largest. The object of this is obvious. L. J.

[We publish the foregoing letter chiefly for the small but encouraging bit of news contained in the first part of it, for the suggestion embodied in the illustration is one which we are not sure that we like. *All* of the figures on a post should be easily readible from the cars. On double-track roads, and in many places on single-track roads, it would be very convenient to have mile posts on both sides of the road and with two faces set diagonally toward the track, one showing the distance from A and the other from Z. It is annoying when trying to estimate the speed of a train on an unfamiliar road to have a post escape you by reason of an intervening obstacle, such as a passing train, or because the post is fixed inconspicuously near some building. Examples of good mile posts (of stone) may be seen on the older railroads leading out of Boston. On passing from the first to the second division of the Boston & Albany, the absence of the posts on one side of the track is at once noticed. A road which feels compelled to economize would probably suit its passengers better by putting up two lines of wooden posts rather than one line of stone.—EDITOR RAILROAD GAZETTE.]

The Condition of the Toledo, St. Louis & Kansas City.

NEW YORK, Sept. 30, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the General Railroad News column of your last issue there is a paragraph giving some figures from the report of the Receiver of the Toledo, St. Louis & Kansas City R. R., which concludes with the statement that "within the last eighteen months every bridge on the system has been rebuilt, substituting iron for wooden structures."

The fact is that there have been no wooden truss bridges on the eastern half of the road for a number of years, they having been replaced by heavy steel and iron structures or masonry, in 1887 and 1888, under my direction and that of my successor, Mr. A. L. Mills, now General Superintendent of the road.

About the same time all the truss bridges on the western half of the road were replaced by new structures in iron, with the exception of a few deck bridges, which were rebuilt very substantially in wood, and at the same time all pile and trestle structures were thoroughly overhauled, and of those which could not then be filled solid by the use of iron pipe culverts the majority were entirely rebuilt, and the remainder were extensively renewed and put in first-class condition for the heaviest engines.

Doubtless the wooden structures have required much expenditure on them since, but my understanding of the matter is that the repairs have been made when needed and that the bridges have alwaye been kept in excellent condition. They are in the charge of an able engineer who is not likely to permit the road to get into the condition which the closing words of your paragraph would indicate.

The amount of liabilities you name ($30,000,000) is evidently from the balance sheet, and of course includes the capital and other items which form no part of the debt; but might not be so understood when given without any details. JOS. O. OSGOOD.

[Mr. Osgood is doubtless quite correct. The Receiver's report does not say a word about renewals of bridges.—EDITOR RAILROAD GAZETTE.]

A Broken Axle and a Bridge Wreck.

TO THE EDITOR OF THE RAILROAD GAZETTE:

. . . A passenger train consisting of engine, mail, and express car and two coaches, was wrecked at a bridge the wreck being caused by the breaking of an axle in the rear truck of the engine tender when the train was within about 14 telegraph poles of the bridge, the break not being discovered by the engineman until the mail and express car, which was immediately behind the engine, was derailed at a point about 500 ft. from the bridge. This car left the track in such a way as to strike one of the end posts of the bridge, knocking that end of the bridge off its seat and into the creek. The mail and express car remained coupled to the engine tender, the east end of which rested in the creek bed. The forward coach became detached from the mail and express car and the rear coach, and turned over on its top down an embankment into water of a depth of several feet. The rear coach turned over on its side down a low embankment, about 300 ft. from the bridge. The engine stopped on the west end of the bridge, just clearing the iron span, which was still resting on west bridge seat.

The bridge was a pin-connected, through span, 93 ft. long, with iron floor beams, and strongly riveted to the sides of posts.

Our Superintendent of Motive Power writes me as follows: "Our inspection of the broken axle showed that this axle had a journal 3¾ in. × 7 in. long, wheel seat $4\frac{13}{16}$ in. diameter, center of axle varying from 3⅝ in. to $3\frac{33}{32}$ in.. from which it will be seen that the axle was of proper limit, save at the center, which is scant in diameter, but all right for a 30,000-lb. car, M. C. B. 3½ in. diameter center limit. I will add that previous to 1889 the minimum diameter of center of axle was not specified by M. C. B. rules, though the wheel seat and journal were. I find no mark on the end of the journal of the broken section sent in, and as we have numbered all our axles since Aug. 23, 1887, the axle belongs to a period previous to that date, being without number and of lines used by us formerly. I think this axle was originally 3¾ in. center, which was the recommended practice of the M. C. B. Association about 1879. The tender and maximum load would be 57,060 lbs., while that of one of our 30,000 lb. cars would be 53,000 lbs., from which it would appear that the axle could not have broken on account of overload, granting that the material was good." GENERAL MANAGER.

System and Precision in Block Signaling.

BY GEORGE H. PAINE.

The argument of Mr. C. C. Anthony in the *Railroad Gazette* of Aug. 16 leaves nothing to be said regarding the necessity for a separate acceptance and permission for each train before its admittance to a block section, and its importance is further emphasized by your comments in the issue of Aug. 23d on the Liberty Park collision.

The propriety of this check is pretty generally recognized, even though it is not demanded by the rules, but a still more important feature of plain manual blocking is the supervision of the way in which the signal men perform their duties; often, as I have frequently noticed, more honored in the breach than in the observance. Several times I have been told by block signal men that there had been no apparent attention paid to the manner in which the block signal rules were obeyed since the occasion of their first application. This is manifestly wrong, and is a condition probably due to the dangerous and increasing belief that in the mere term "block signaling" there is a fetish which is a charm against accidents.

If the code is correctly carried out no collisions, either butting or rear, can occur; but it is just that which is not done. How then is a practicable supervision to be exercised which will surely develop the most serious faults of operation?

A simple and comparatively inexpensive method is suggested by the experience of an important single track railroad. The General Manager of this line, discouraged by the evidences of carelessness, criminal at times, in the issuance of train orders, established in his office a clerk whose first duty it was to make a critical examination of every train order with reference to spelling, the writing out of numbers and all other questions prescribed by the book of rules for that service.

The discovered errors were recorded against the division on which they occurred and against the person who made them. At the end of each month a summary was compiled, percentages worked out and the result distributed among the division superintendents.*

The effect was marvelous and immediate. Impressions no longer ruled, for there were the facts; constitutionally careless men became known and were eliminated, while the recorded errors fell from several hundred per month to *none* on at least one of the divisions and perhaps on more than one. And at what cost? The pay of one clerk, say $600 a year. When this sum is compared with the accepted results of erroneous train orders it sinks into insignificance.

But the good effects were not limited to the items already enumerated; they were seen in a more prompt attention to business generally on the part of telegraph operators and an increased rapidity in the delivery of orders to trains, hence in the movements of the trains themselves.

It seems certain that some such plan of watching the operation of block working would more than repay the incidental cost. An absolute knowledge would be secured as to the methods of each block signalman, instead of a feeling that "so and so" is not so careful as he might be, and this knowledge would be always available through the filed reports. The value of an acquaintance with each operator's idiosyncracies, where the personal equation forms so large an element of the results as it does in manual block signaling, is not to be mini mized.

The method of securing this knowledge may well vary considerably. Probably the best plan would be to have a separate sheet on which every act relating to block signaling, and the time at which it was performed, should be recorded. Each sheet would have two main headings, one for communications with the station on the right, the other for the station on the left. The main headings should each have sub-headings, for the signals sent, the signals received, the trains forwarded, and the time at which each of them was done, so that a sheet would have the appearance of the subjoined table:

This form would be suitable for single track only, but a slight modification will adapt it for double track work. It can be mounted on a board or card and kept in a place so convenient that the making of the record need consume little time. The time consumed is the chief objection to the idea, but is an objection which may well be disregarded in view of the improvements in the service that will be secured.

..... Station, ... 18....

Communications with Station.....				Communications with Station			
Signals Received.	Signals sent.	Trains forwarded.	Time.	Signals Received.	Signals sent.	Trains forwarded.	Time.

The entries should be made with an indelible pencil and erasures or alterations should count as errors of the worst class. The record should be sent to the Division Superintendent's office daily, and a comparison of the operations that have occurred between adjoining stations should be made by some clerk who is to regard that as the one duty which must not be overlooked so long as the reports are required.

The comparison will not be so difficult as at first appears, for the columns headed "Signals Sent" and "Signals Received" on the sheets of adjoining stations *should* agree exactly as well in the numbers themselves as in their order and the times at which they were sent. If the records do not agree in these particulars something is wrong, and it is this very something which is not now known and which should be demonstrated. If a constant variation is seen in the time when the signals were said to have been sent and received it is evident that one, at least, of the clocks was wrong, and the question arises, which one it was, and why? Many interesting facts will be developed by this record now unsuspected; for instance, it will be found that some signalmen use a certain call, while, for the same purpose, other signalmen constantly use an entirely different one.

The knowledge of these troubles once held, the manner of correcting them must be left to individuals, but it is not to be denied that they exist, and if they do exist an attempt to cure them should be made.

Whether or not the Liberty Park collision was caused by an improper observance of existing rules the reports do not say, but one thing is certain, most of these difficulties will cease as proper rules are adopted and their observance is insisted upon.

Sixteenth Street Lift Bridge, Milwaukee.

The Sixteenth street bridge in Milwaukee, Wis., across the North Menominee canal, is a type of lift bridge very different from the rolling lift bridge across the Chicago River at Van Buren street, Chicago, which was described in the *Railroad Gazette* of Feb. 15th, and it has given

* The process described by Mr. Paine has been carried out on other railroads, as readers of the *Railroad Gazette* will recall.—EDITOR.

better satisfaction in its operation. The conditions leading to its adoption were the narrowness of the channel and the necessity of obstructing as little as possible of the valuable dock space along the canal, both of which made it undesirable to use a swing bridge. For these reasons Mr. Geo. H. Benzenberg, City Engineer, decided to adopt some form of lift bridge, and chose this form, which has been patented by Mr. M. G. Schinke, Assistant City Engineer. Mr. Benzenberg prepared specifications from which the bridge was built, the general design of which was prepared by the Wisconsin Bridge and Iron Co., who secured the contract.

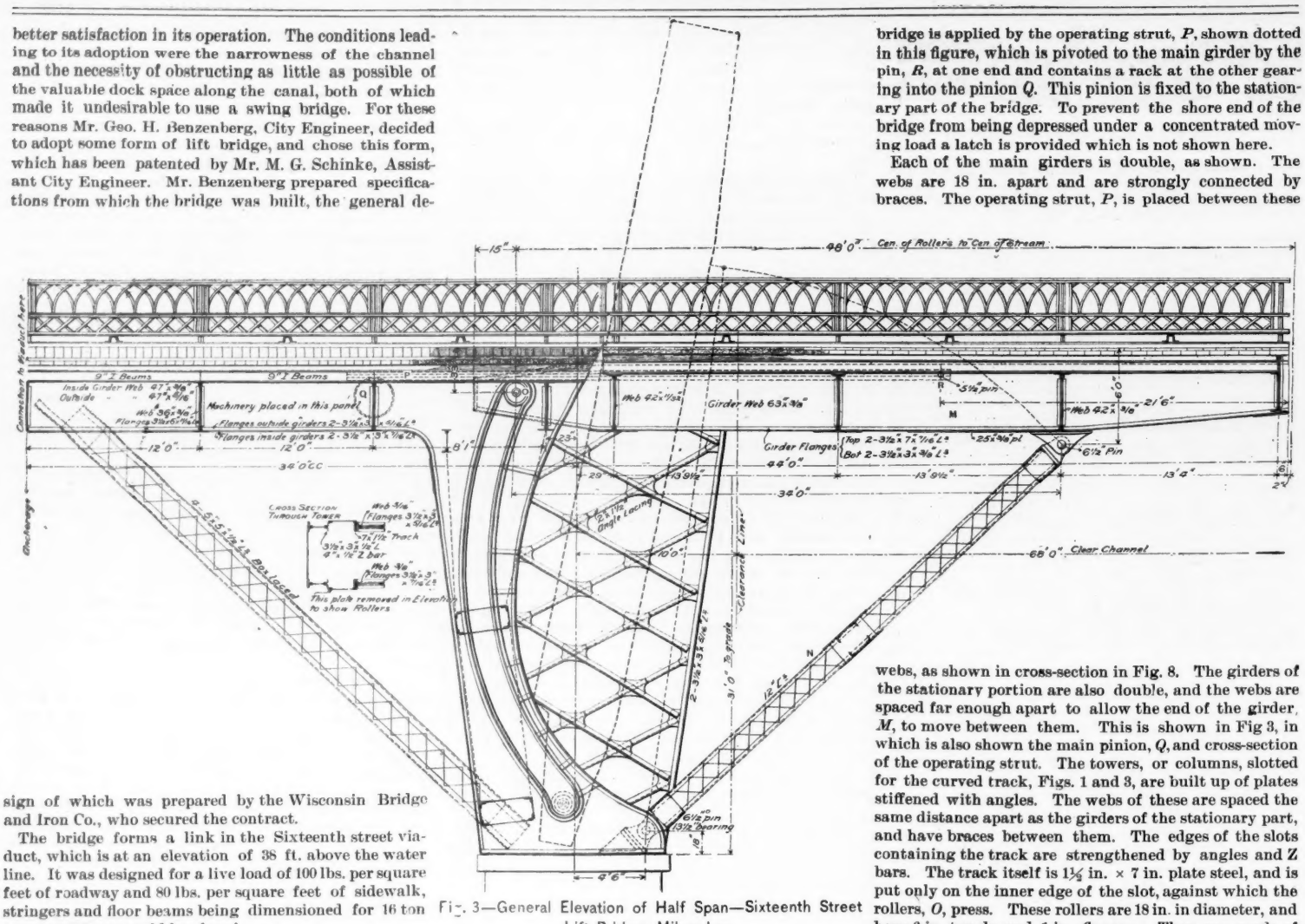


Fig. 3—General Elevation of Half Span—Sixteenth Street Lift Bridge, Milwaukee.

Fig. 1 is a photograph showing the bridge closed, and Fig. 2 shows it open. It can be seen that it presents a neat, light and graceful appearance.

The bridge forms a link in the Sixteenth street viaduct, which is at an elevation of 38 ft. above the water line. It was designed for a live load of 100 lbs. per square feet of roadway and 80 lbs. per square feet of sidewalk, stringers and floor beams being dimensioned for 16 ton cars as many as could be placed.

Fig. 3 is a sectional elevation of a half span giving a general drawing of the operating parts. Fig. 4 is a half cross-section. The main girder, *M*, of which there are two for each half span is supported by the swinging strut, *N*, near its outer end and by the roller, *O*, at the other. This roller is fastened to the main girder and moves on a fixed curved track which is so constructed that the pressure of the roller is always normal to the curve for any position of the main girder. The moving portions are therefore in equilibrium necessitating no lifting of weights but only the overcoming of frictional resistance. The center of gravity of the movable portion is not lifted but is moved backward in a horizontal line. The power to tilt the bridge is applied by the operating strut, *P*, shown dotted in this figure, which is pivoted to the main girder by the pin, *R*, at one end and contains a rack at the other gearing into the pinion *Q*. This pinion is fixed to the stationary part of the bridge. To prevent the shore end of the bridge from being depressed under a concentrated moving load a latch is provided which is not shown here.

Each of the main girders is double, as shown. The webs are 18 in. apart and are strongly connected by braces. The operating strut, *P*, is placed between these webs, as shown in cross-section in Fig. 8. The girders of the stationary portion are also double, and the webs are spaced far enough apart to allow the end of the girder, *M*, to move between them. This is shown in Fig 3, in which is also shown the main pinion, *Q*, and cross-section of the operating strut. The towers, or columns, slotted for the curved track, Figs. 1 and 3, are built up of plates stiffened with angles. The webs of these are spaced the same distance apart as the girders of the stationary part, and have braces between them. The edges of the slots containing the track are strengthened by angles and Z bars. The track itself is 1⅛ in. × 7 in. plate steel, and is put only on the inner edge of the slot, against which the rollers, *O*, press. These rollers are 18 in. in diameter, and have 6-in. treads and 1-in. flanges. They are made of cast steel, and work on 5 in. pins or axles, which are carried by cast steel bearings, fastened to the main girders, *M*. To reduce the friction between rollers and axles, spring steel roller bearings, 6 in. long, are provided, on which the rollers turn.

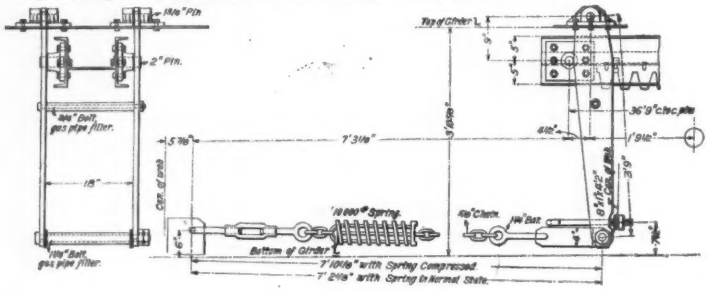


Fig. 9.

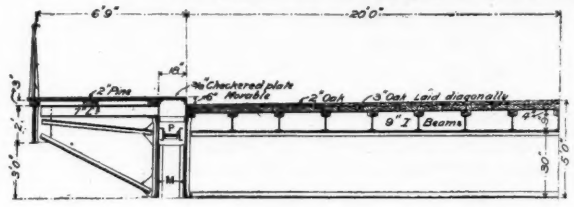


Fig. 8.

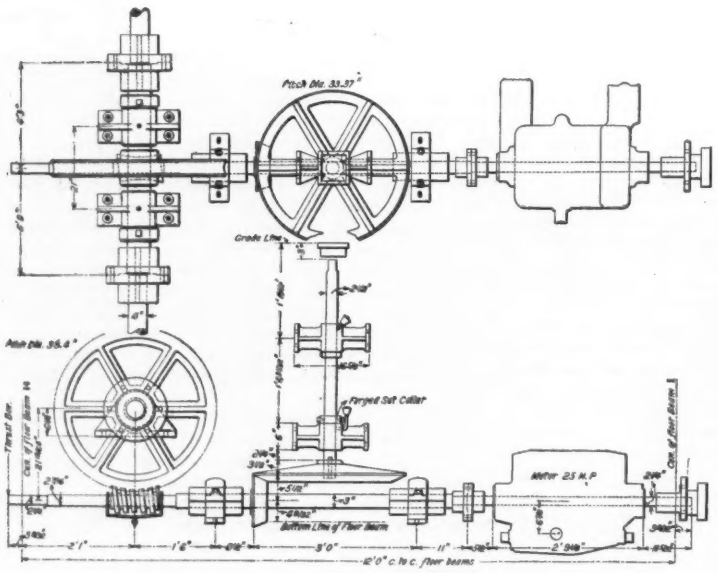


Fig. 6.

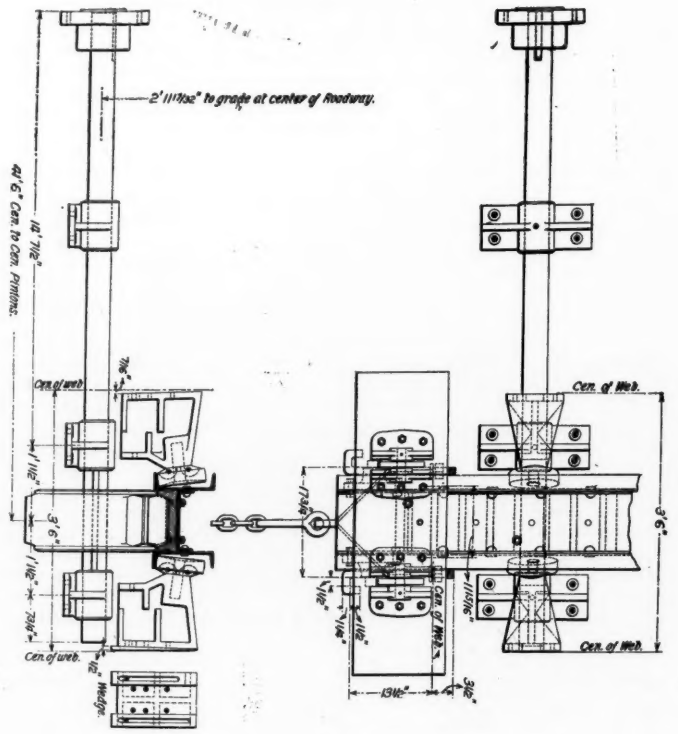


Fig. 7.

Details of Machinery—Sixteenth Street Lift Bridge, Milwaukee.

The two supporting struts are each made of two 12-in channels, double laced and pivoted at both ends by 6½-in. pins. They are connected by lateral bracing of three latticed struts, one at each end and one in the middle,

and by 1¼-in. diagonal tie rods. The towers are also strongly braced laterally, as shown in Fig. 4.

The roadway of the bridge is shown in Figs. 8 and 4. In the movable portion it consists of a double layer of oak planks laid diagonally on stringers placed on top of 9-in. I-beams, which rest on the lateral girders. In the stationary portion a course of 7-in. cedar blocks is put on top of the oak planks.

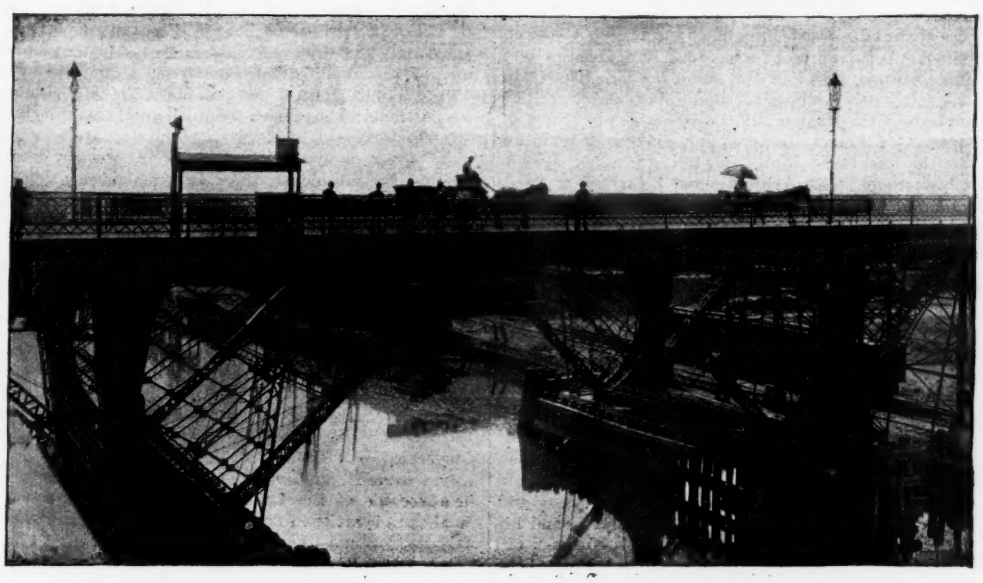


Fig. 1.—The Sixteenth Street Lift Bridge at Milwaukee—Bridge Closed.

The position of the operating machinery is shown in in Fig. 3, while the general diagram, Fig. 5, shows a plan of the same. It consists for each span, in addition to the operating struts, *P*, and main pinions, *Q*, previously mentioned, of a line of shafting on the ends of which the pinions, *Q*, are keyed, and another short shaft on which is a 25 H. P. motor. Connections between the two lines of shafting is made by an Albro Clem worm wheel. Placed between the motor and worm are bevel gears which permit the operation of the bridge by hand should any accident happen to the motor. Detail drawings of these are given in Fig. 6. The ends of the shaft carrying the motor are held by thrust bearings bolted to the lateral girders *H* and *I*. The number of revolutions required for opening the bridge is 3.6 for the main shaft and 216 for the motor shaft.

Fig. 7 shows the cross-section of the operating strut and the way it is held in gear with the pinion, *Q*, by rollers bearing against the flanges of the channels of which it is composed. In this figure is also shown a plan of the end of this strut which is connected to springs in order to prevent shocks in closing and also to absorb the surplus power of the motor in case it is not stopped at the right instant. A better idea of this arrangement is given by Fig. 9.

The general dimensions of the bridge are:

Width of roadway	40 ft.
" " sidewalk, stationary part	10 "
" " " movable	7 "
Grade of roadway shore water	38 "
" " sidewalk " "	38 5 "
Width of clear channel between fenders	68 "
Distance of river piers center to center	88 "
Length of movable parts each	44 "

The bridge has been in continuous service since March 8, and none of the working parts are showing any appreciable wear except the thrust bearings of the motor shaft, which are somewhat too light for the service. These will be replaced after the close of navigation by heavier ones.

The general features of the bridge and principle of operation were devised and patented by Mr. M. G. Schinke, to whom we are indebted for information used in this article. Due credit is to be given to Messrs. John Geist, Chief Engineer, B. L. Norden, Designing Engineer, and S. B. Harding, Superintendent of the Wisconsin Bridge and Iron Works for their co-operation in making this structure a success.

The Race to Aberdeen.

BY W. M. ACWORTH.

You have, of course, heard long ere this of our railway race to Aberdeen, and indeed the report which the Atlantic cable brought us a few days back of a certain special run on the New York Central to Buffalo would seem to imply that what has been happening here has not been without immediate effect in America. But perhaps though in one sense I have only stale news to tell, a connected account of the whole matter will not be without interest for readers of the *Railroad Gazette*.

I need hardly premise that when English railway men want to fight, the resource of rate cutting is not practically available, and that therefore a contest in speed is the promptest and most efficacious course open to them. But perhaps I ought to say a word about the parties to this particular struggle.

For all but half a century the East Coast and the West Coast routes have competed for the traffic between London and Scotland, and the competition has been rendered more keen latterly since the East Coast route was improved by the opening of the Forth Bridge. About 20 years back there was opened a third or Midland route to Scotland which at first was of considerable importance, but of late years has been content to accept, as far as passenger traffic is concerned, a position of obvious inferiority such as with you is held by the Erie or Lehigh Valley route to Chicago when compared with the Pennsylvania or the New York Central. With the Midland, therefore, we need not concern ourselves here. The East Coast route is in the hands of three companies as follows:

London to York	188 miles	Great Northern.
York to Edinburgh	205 miles	North Eastern.
Edinburgh to Aberdeen	130½ miles	North British.
Total, 52 ½ miles.		

The above division is, I should say, according to engine

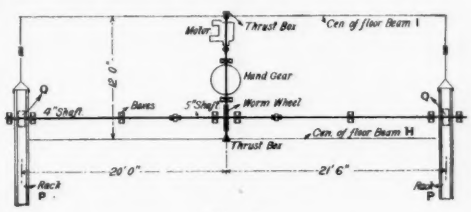


Fig. 5.

working. The actual ownership is somewhat different, the North Eastern line extending South as far as Shaftholme, 30 miles on the London side of York, and only going northward as far as Berwick, 57 miles short of Edinburgh.

The West Coast route is in the hands of only two companies:

London to Carlisle	293¼ miles	London & North Western.
Carlisle to Aberdeen	210½ miles	Caledonian.
Total, 539¾ mile .		

Next, a word must be said as to the difficulties of the respective routes. The East Coast road leaves King's Cross, London, with a sharp rise of 1 in 110 for 1½ miles, followed by 3 miles fairly level. Then there is a steady climb of 1 in 200 for eight miles, thence for some 80 miles the road is fairly level with short ups and downs, nowhere worse than 1 in 200. From the 91st to the 100th mile post it rises steadily about 5 miles at 1 in 200 followed after a short rest by 3 miles of 1 in 178 to Stoke Tunnel, 440 ft. above sea level. Thence to Grantham (105¼ miles from London) it is all down hill, but as every train stops at Grantham to change engines there is no chance for exceptional speed. From Grantham to York (82¾ miles) the line is very level. Thence northward it rises steadily for some 50 or more miles, but with an average gradient not worse than 1 in 600, then after dropping sharply, rises 5 miles of 1 in 150, and then falls again to Newcastle (80½ miles). From Newcastle northward to Berwick (67 miles) there is nothing worse than 5 miles of 1 in 170; thence there are stretches of 5 miles of 1 in 170, and 8 miles of 1 in 200, till finally, just before entering Edinburgh (57½ miles), there is a sharp bit of 1 in 78 right up to the platform. The only points between King's Cross and Edinburgh, at which, to my knowledge, speed is always reduced, are Peterborough, Retford and Berwick stations and Selby swingbridge. Northward from Edinburgh the road is fairly level, but curves are frequent and severe, the railway for a good part of the distance having been originally intended merely for local traffic. Beyond Dundee (452 miles from London) there is a stretch of some 16 miles single line, and as your readers know our system of working such lines necessitates a slack every few miles to pick up and drop a "staff" or a "tablet." So much for the East Coast; now for the West.

Leaving Euston station with a climb of 1 in 75 for a mile, there are 6 miles level followed by a steady climb mostly about 1 in 330 to Tring (31¾ miles). Thence to Crewe (158 miles from London), there are at various points rising grades, as follows: 7 miles of 1 in 330, 6 miles of 1 in 342, 5 of in 330, and 16 varying from 1 in 400 to 1 in 600. Forward to Preston (51 miles) there is at one point a 6-mile rise varying from 1 in 120 to 1 in 330, while between Preston and Lancaster it is very fairly level. But the Lancaster and Carlisle section is very different. First, there is 2½ miles of 1 in 131, then after a short break a continuous rise varying from 1 in 193 to 1 in 106 for 13 miles; then a rest of 5 miles followed by 2 miles of 1 in 147, leading on to 4 miles on 1 in 75 up to Shap Summit 920 ft. above sea level. Thence to Carlisle (31¾ miles) is a sharp descent all the way. At Carlisle the Caledonian begins with 40 miles of comparatively level line, though at one point it has a gradient of 1 in 200 for 8 miles against it, and altogether there are 17 miles 1 in 200 or worse. At the 40th mile post begins the great Beattock bank with 2 miles of 1 in 88, followed by 2 miles of 1 in 80 and then 6 miles of 1 in 75. Beyond Beattock Summit (1,015 ft. above sea level) there is a long and steady descent, then 5 miles up 1 in 150 and a rapid climb down. Then for some miles the road is easy enough except for 2 miles up 1 in 126 as far as Stirling (117¾ miles from Carlisle). Leaving Stirling there is a steep climb of 1 in 90 for 6 miles, with a gentler rise for 9 miles beyond, thence down once more to sea level at Perth (450 miles from London). The remaining 90 miles to Aberdeen are fairly hard, but need no special notice. Through Rugby station (82¾ miles from London) and through Preston

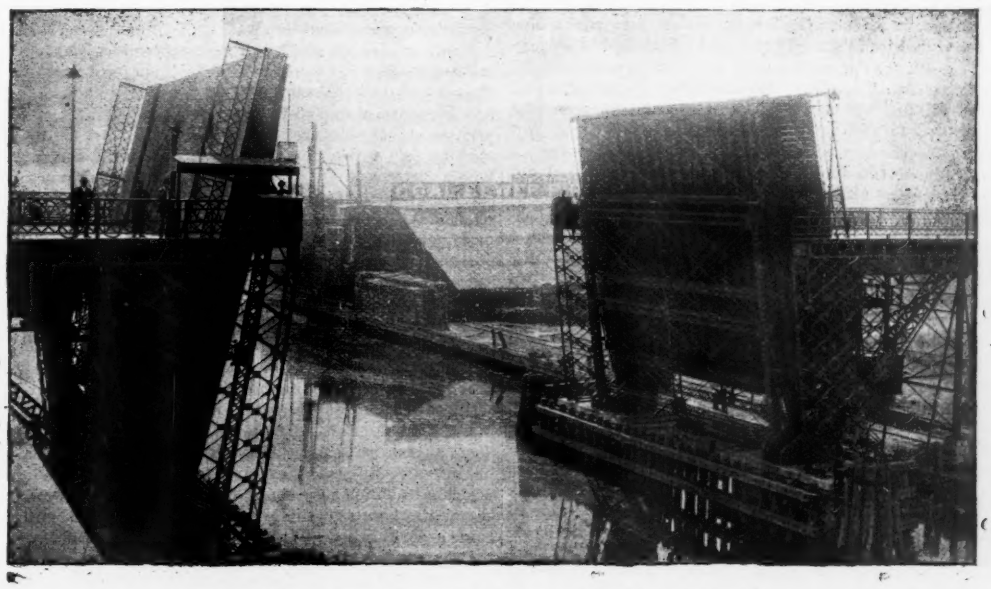


Fig. 2.—The Sixteenth Street Lift Bridge at Milwaukee—Bridge Open.

station (209 miles), it is usual for trains to slacken speed, but I know no other point on the West Coast route where this is found necessary. When I add that between London and Carlisle there are track tanks, but that they are not in use on the lines of any of the other companies, all has been said that need be as to the roads in question.

To turn to history. The race to Edinburgh of seven years ago, which your readers will not have forgotten, had its origin in the claim of the West Coast that they should be allowed to run as between London and Edinburgh in the same time as the East Coast, spite of the

Finally, it should be noted that for the last 30 miles of its route the East Coast has not an independent line at all. From Kinnaber junction to Aberdeen the North British runs under statutory powers over the line of its rival, the Caledonian.

One main interest in the race therefore to those who actually traveled by the trains was on reaching Kinnaber signal box to know whether the rival train had already passed it. For evidently the train first passed Kinnaber was bound to keep in front all the way to Aberdeen.

fact that their road was eight miles longer, and as will have been seen by the particulars given above a good deal harder. That claim the West Coast made good, and since 1888 both routes have run to Edinburgh in practically identical times. On the other hand, there has apparently been an understanding that to Perth, where the East Coast has the advantage of 9¼ miles (440¾ miles against 450), and to Aberdeen, where it has, as I have said, an advantage of 16¼ miles, there should be a difference maintained of about 10 minutes or a quarter of an hour. The bulk of the traffic from London to Aberdeen goes at night, and by each route the express leaves London at 8 p. m. There were also supplemental and slower trains leaving by the West Coast at 10, and by the East at 10:40 p. m. The West Coast trains in June last reached Aberdeen at 7:50 a. m. and 2 p. m., respectively; the corresponding East Coast trains at 7:35 a. m. and noon. On June 22 the West Coast advertised that from July 1 the 8 o'clock would arrive at 7:40 instead of 7:50, and the 10 o'clock at 11 instead of 2 p. m. It has since been stated, apparently by authority, that the reason for the alteration of the important 8 o'clock train was merely to make more certain the connection with a local train leaving Aberdeen at 8:05 a. m. Be this as it may, the East Coast companies who had not received private notice in advance of the change, as they claim to be usual between companies in similar circumstances, at once took the acceleration as a challenge, and at the last moment, though their July time-tables were, I believe, practically all

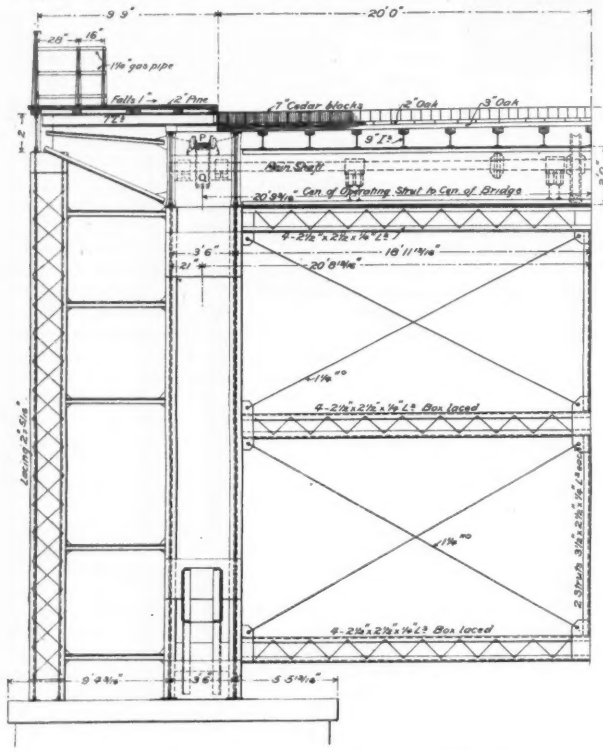


Fig. 4.—Half Cross Section—Milwaukee Lift Bridge.

printed, advertised that their 8 o'clock train would be timed to arrive at Aberdeen at 7:20, and that a new train would leave King's Cross at 10, reaching Aberdeen at 11 a. m., that is, earlier than the corresponding West Coast train. The West Coast waited a fortnight and then, picking up the glove, announced that from and after July 15 the 8 p. m. from Euston would arrive at 7 a. m., and the 10 p. m. at 10:40 a. m., both of them that is in front of the East Coast trains. A week passed and the East Coast altered their 8 o'clock to arrive 6:45 and their 10 o'clock to arrive 9:45. And at this point the contest, which was now practically avowed, entered on a fresh phase.

In the first place, the West Coast gave up the 10 o'clock match as hopeless. The 10 o'clock *ex*-King's Cross was a new, light train. The 10 o'clock *ex*-Euston is an old-established and very heavy train, carrying passengers, and still more, mails and parcels, to half the important towns in the country. To revolutionize its working in the height of the holiday season was not to be thought of. There was another change in the fact that the West Coast ceased to publish the timing of its trains altogether. When the East Coast advertised the arrival of their 8 o'clock train as 6:45, the West Coast altered their working time-table to make their own arrival 6:35, but they issued no notice of the fact to the public. Day after day, however, they continued to reach Aberdeen in front. After submitting to this for a week, the East Coast accelerated once more, and announced that from July 29 their arrival time would be 6:25 a. m. "6:20 a. m.," instantly replied the West Coast authorities, but only in their working notices and not by public announcement. "Bradshaw" for August still gave the West Coast time as 7 a.m. And in this position matters remained for three weeks, till Aug. 18. It should be explained that in the last week of July and the first fortnight of August the rush of tourist traffic from London to Scotland is so great that the railways have great difficulty in carrying the traffic. Expresses are commonly run in duplicate, frequently in three parts, sometimes in four. There was really no time or energy to spare for fighting, but the West Coast profited by the glut of traffic to improve its record, for, by selecting the passengers who were going to Perth, Aberdeen and beyond, and putting them into the first portion of its 8 o'clock train, it could neglect intermediate stations altogether, call where it pleased and run at what speed it liked, while the second and third portions of the train could make the advertised stoppages at the advertised times and finally reach Aberdeen at the published hour of 7 a.m. The East Coast, wisely or not, refused to adopt the same tactics. The train stuck religiously to the advertised tables, and never left an intermediate station till the time was up. Now, of course, more time can be saved in a journey of 540 miles than the East Coast could save in the 54 miles between its last stoppage at Arbroath and its arrival at Aberdeen. Naturally, therefore, to the ordinary newspaper reader the East Coast seemed all through these three weeks to be getting much the worst in the fight.

In the early days of August all the great English railway companies are accustomed to hold their half-yearly shareholders' meetings, and shareholders' meetings being not so entirely matter of formality with us as I believe they are with you, the chairmen of the companies usually take advantage of them to express their views on the questions of the day. Accordingly, the chairman of the four great English companies concerned—Scotch companies hold their meetings at a different time—all referred to the race to Aberdeen, as by this time it had come to be called. The chairman of the Midland said racing was very wrong and very foolish, and he and his company would have nothing to do with it. The three other chairmen of the North Western, North Eastern and Great Northern respectively, all agreed that racing was wrong and foolish. They each of them added that they weren't racing at all, that the other side began it, and at any rate they were not going to be last in the race. And thereupon the shareholders in all the companies went home contented.

Not so the officials. The rush of the tourist traffic having begun to subside, they girt up their loins for a final tussle. On August 19, and this time without giving public notice, the East Coast fixed 5:40 a. m. as its time of arrival at Aberdeen. The train, in fact, got there at 5:31, only to find that the West Coast had arrived at 5:15. For, though public notice had not been given of the proposed acceleration, it was necessary to notify the Caledonian Company of the time the East Coast train would pass Kinnaber junction signal-box, and this information the Caledonian naturally did not hesitate to use against its rival.

Stealing a march having proved impossible, it only remained to see what could be done by sheer hard running. Tuesday night's train by the East Coast route was in at 5:11, but once more the West Coast was in front, having arrived at 4:58—the first time I fancy that over a mile a minute (540 miles, 538 minutes) was ever done for so long a distance. On the night of Wednesday-Thursday the East Coast at length got their heads in front. They reached Aberdeen at 4:40 a. m. (523½ miles in 520 minutes), while the West Coast only bettered their previous night's performance by three minutes, getting in at 4:55. So confident were the East Coast authorities, apparently, that this last performance could not be beaten that they immediately put in hand the reconstruction of an important bridge at Durham, and so put further high speed on that part of the line out of the question. But they had reckoned without their host.

On the night of Thursday, Aug. 22, the West Coast made a final effort and succeeded in reaching Aberdeen at 4:32 (540 miles, 512 minutes). The East Coast having already placed themselves, as I have said, in a position in which they could only compete under exceptional disadvantage, this was the final trial and the race came accordingly to an abrupt conclusion. "Bradshaw" for September shows that a truce has been patched up on terms that the two routes are to be practically equal. To Perth the West Coast is given an advantage of 4 minutes, its arrival being 4:40 a. m. as against 4:44 East Coast. At Aberdeen the position is reversed, the East Coast arriving 6:25 and the West Coast 6.30 a. m.

It is interesting to compare the Perth times with those of the Empire State Express:

	Miles.	Time. Hrs.	Min.
Empire State	440	8	40
East Coast	440¾	8	44
West Coast	450	8	40
Let me add also:			
East Coast to Dundee	452	8	47

The September "Bradshaw," however, shows not only the end of the Aberdeen contest, but the beginning of another contest which may prove of considerable importance hereafter. Glasgow, with a population of about 750,000, is much the most important town in Scotland, and for traffic between London and Glasgow the East Coast, with a route nearly 40 miles longer (440 as against 401½) than the West Coast, has hitherto hardly attempted serious competition. It looks, however, as though the East Coast had learned from the West that the longest route in mileage need not necessarily be the longest in time, for the whole of the East Coast night trains in both directions (I need not trouble American readers with particulars) have been so much quickened up as to give a service on the whole as good as that of the West Coast. Presumably the West Coast will reply by corresponding improvements; possibly it may even attempt reprisals elsewhere. We shall see later on.

The Deep Water Ways Convention.

We continue from page 637 of our issue of last week the report of the Cleveland Convention of the Deep Water Ways Association.

At the morning session of the second day (the 25th) the report of the Committee on Credentials indicated that over 300 delegates were present. "International President" Howland invited Mr. D. K. McGinness, of St. Paul, to preside. A number of papers were presented, brief abstracts of which we shall give, not following the order of presentation.

Mr. George H. Anderson, of Pittsburgh, stated that the advocates of the Lake Erie and Pittsburgh Ship Canal were heartily in favor of the deep water way to the sea. Mr. James Fisher, of Winnipeg, suggested a Government inquiry as to the feasibility of constructing a canal from the head of Lake Superior to the Red River Valley. Mr. E. C. Gridley, of Duluth, stated that plans are under consideration for a canal from Duluth to the wheat fields of Dakota and Manitoba.

A. R. Smith, Esq., Secretary of the New York Executive Committee of Commercial Bodies for the Improvement of Canals, read a paper on the Relation of New York State Canals to the Proposed Ship Canal. Extracts from this paper follow:

AN IMPROVED ERIE CANAL OR A SHIP CANAL.

Whether a nine-foot Erie Canal will come up to your wishes or ideal, I presume, depends altogether upon the efficiency and cheapness with which it will accommodate lake commerce. We, of New York, believe that it will fully do that. I shall attempt to present some facts for your consideration that will prove this, and I feel sure that you will not, at least, be any less interested in a great artificial waterway which has existed for seventy years, and which it is proposed to improve, than you will be interested in waterways which exist only in the brains of their projectors, but which it is proposed to construct.

The Erie Canal is 352 miles in length, begins at Buffalo and ends at Albany, thus connecting Lake Erie with the Hudson River. It has cost about $50,000,000 to construct. It is 70 ft. wide on the surface, 56 ft. wide on the bottom, and supposedly 7 ft. deep. Its locks are 110 ft. long, 18 ft. wide and 7 ft. deep over miter sills. There are 72 of these locks. In several places two are close together, and at Lockport there are five, and between Cohoes and Troy there are a series of 16. All of the locks are double, one alongside of the other, so in truth one might say that there are 144 locks. They are always spoken of as 72. Forty of these 72 locks are lengthened—that is to say, 220 ft. long, in which two boats are put through at one lockage. The bill now before the people provides for the lengthening of the unlengthened locks. The present State Engineer and Surveyor has stated that he can, with a pair of modern steel lift-locks, supplant the 16 locks at Cohoes, and that he can at Lockport displace the five present locks with a pair of steel lift-locks. A bill appropriating $100,000 was passed by the last Legislature to build a pair of steel lift-locks at Rexford Flats, on the Erie Canal, to displace two pairs of short locks. All of these proposed steel lift-locks will accommodate a double boat at one lockage. Another improvement contemplated by the present State Engineer and Surveyor is the substitution of steel gates, on rollers, in place of the present wooden swing gates, and by other trifling changes in the locks to gain 12 ft. That is to say, these last mentioned improvements will permit the building of canal boats about 12 ft. longer than at present, which in a pair of double boats will mean an increase in their carrying capacity of about 80 tons.

All of these improvements will doubtless be made concurrently with the proposed deepening of the Erie Canal, and in three or four years at most we are promised the completion of the work. I have not stated to you one impracticable thing, but have shown you the present condition of the Erie Canal, which last year accommodated a traffic of 3,000,000 tons, and which improved will have a maximum capacity at least four times greater than that carried last year.

The present year will do to illustrate the operation of the Erie Canal, bearing in mind that if the down rates are low the up rates are high, and are thus pretty nearly balanced. We may use a fleet of six canal boats, including a steamer, for the purposes of this illustration:

Fleet carries down, per trip, 46,000 bushels wheat.
Fleet carries down in 7 trips 322,000 bushels wheat.
Fleet carries up, per trip, 850 tons freight.
Fleet carries up, in 7 trips, 5,950 tons freight.
Rate on wheat, 2c. per bushel. Fleet earns $6,440.
Rate on up freight, 60c. per ton. Fleet earns $3,570.
Gross earnings of fleet in season of navigation, $10,010.

When the Erie Canal is deepened to 9 ft. this fleet will be able to load a foot deeper, and make three more trips in a season of navigation—some say 12 trips all told. With 2 ft. of water under the bottom, where now there is scarcely as many inches, half of the distance, it cannot be doubted that boats will travel faster—in fact at double the present two miles an hour rate of speed. It will cost no more for coal to travel twice as fast with 2 ft. of water under the bottom, nor as much, as is now required. In fact, the expenses of navigation will not be increased appreciably, even should the trips be doubled, in a season. We will assume the most moderate estimate, however, of ten trips in a season. I will now show you at what rates of freight this fleet could earn just as much as now and at no additional expense:

Fleet will carry down per trip, 58,000 bushels wheat.
Fleet will carry down, in 10 trips 580,000 bushels wheat.
Fleet will carry up, per trip, 1,150 tons freight.
Fleet will carry up, in 10 trips, 11,500 tons freight.
Rate on wheat, 1⅛ cents a bushel, fleets earn $6,525.

Rate on up freight, 30 cents a ton, fleet earns $3,450.
Gross earnings of fleet in season of navigation, $9,975, or $35 less than the same fleet earns now.

I hazard nothing in asserting that, with the canal business in the hands of large companies, with solicitors out looking for freight in all of the great manufacturing cities, as the railroads have, under the moderate improvement that is on the eve of commencement, it requires no strength of imagination to forsee that a canal fleet will be able to make 10-day trips, regularly, or at least 20 in a season, and without any further deepening than 9 ft. Or, that the 9-ft. Erie will be able to carry, with the fleet of boats now navigating it, under business-like management, four times what it now carries, or, approximately, 12,000,000 tons of freight at an average of 15 cents a ton, a distance of 500 miles.

Assuming your ship canal to cost $200,000,000—the lowest estimate that is put forward for a 26-ft. ship canal—and a traffic of 12,000,000 tons would need to bear a toll of 66⅔ cents a ton to pay interest on the investment, to say nothing of the cost of maintenance. Even should the traffic of such a canal double, or approximate to 24,000,000 tons, the toll would need to be 33⅓ cents a ton to pay interest on the investment at 4 per cent. Your experience at the Soo Canal will enable you to judge whether you could lock through a ship canal a traffic exceeding 12,000,000 tons. If you required double locks to accommodate such a traffic—and would you not?—how much would it add to the amount that you would need to raise annually, to pay interest on the investment, by tolls? Remember that the canal which it is proposed to improve in New York state paid into the State Treasury $34,000,000 more than they cost, up to the time tolls were abolished, and that this surplus, if put at interest, would have yielded a revenue sufficient to forever maintain these canals, without costing the people a dollar. Surely, it is not proposed that a ship canal, to cost from $200,000,000 to $500,000,000, shall be made a free gift to commerce, that the money shall be sunk, forever, without hope of even interest on it, much less a return of the principal?

Consider for a moment that the interest on the investment of $200,000,000 for the construction of a ship canal, if at 4 per cent., would pay for the transportation of 60,000,000 tons of merchandise from Buffalo to New York, through the Erie canal improved to 9 ft., should such or duplicates of it carry it. And the interest on an expenditure of $500,000,000 would pay for the transportation of 133,333,333 tons of merchandise carried over competing 9-ft. barge canals.

If the entire 40,000,000 tons of freight now moved on these lakes were to use the ship canal, and its locks and width were of a size to accommodate it, at a conservative estimate of $500,000,000 for the cost of its construction, interest at 4 per cent. obtained from tolls would require a levy of 50 cents on every ton that used it—a toll three times higher than the freight could be moved for through competing 9-ft. canals, with 7-ft. barges.

If the Government were able to effect a loan of five hundred millions of dollars, even at three per cent. interest, it would probably take a hundred years to pay off the bonds in, and it would be interesting to obtain an actuary's figures of the amount that it would be necessary to raise, annually, to pay interest and provide a sinking fund to wipe out the debt even in a hundred years. Certainly it would be so colossal a sum that the people would be a long time consenting to submit to it throughout their own and the lifetimes of their great grandchildren.

The people of New York, containing one-tenth the population, and probably one-fifth the wealth of the Union, are willing to spend nine millions of dollars, wisely, economically, conservatively, and they believe, sufficiently, for the needs of commerce requiring an outlet from the lakes to the sea, and if, in the course of a half century, the improved canal should be found inadequate, an expenditure of another nine millions of dollars or so for additional improvements might be justified.

NECESSITIES AND ADVANTAGES OF A SHIP CANAL TO THE OCEAN.

Mr. Dennison B. Smith, Secretary of the Toledo Produce Exchange, presented a paper under the above title. He gave figures as to the growth of lake and foreign commerce, increase in carrying capacity and speed of vessels, change from sail to steam, etc. He also gave figures of the exports of wheat from the United States and from Russia, mentioned the competition to be expected from the Argentine and elsewhere, and concluded that we must reduce the cost of getting our wheat to European markets if we are to hold our pre-eminence.

Mr. Smith anticipates that a low, outward cost of carriage can be obtained by even a 21-ft. waterway from Lake Erie to the Atlantic Ocean. He estimates, in fact, that such a waterway would permit the carriage of wheat from Duluth or Chicago to Liverpool at 3⅛ cents a bushel and corn at 3¼ cents. The cost of carrying flour would be 15 to 17½ cents per barrel, the cost of moving provisions from Chicago to the European markets would be reduced from 32 cents per hundred to 8 or 9 cents.

As to the route, he is willing to yield to the conditions that may be developed by surveys. If international agreement could be made, and our government will appropriate money towards the completion of the Canadian system at a much earlier date than would be required for an independent undertaking, public opinion in the West will acquiesce in such a settlement of the question.

Another advantage to be gained is that "we can build at our lake ports great freight shops in competition with the world and for the world, having cheap ore, cheap coal, or, if wooden ships should be wanted, cheap lumber, and a great shipbuilding industry can be established on the lakes." A ship canal and shipbuilding on the lakes would, he considers, relieve the necessity for subsidies.

Finally he draws a glowing picture of "a procession around the world of swift, beautifully modelled, substantially built and thoroughly equipped American freight steamers with the American flag at the mast-head. There is a fascination in the ownership and management of beautiful vessels. It outstrips the love of horses and is in close analogy with the love of women. Our ships can roam the world-wide seas for a winter campaign entering the competing strife with other flags."

SECTIONALISM, RAILROADS AND DEEP WATERWAYS.

Prof. L. M. Haupt, of Philadelphia, presented a paper with the above title. He aimed to show that sectionalism and the opposition of railroads have systematically stifled the development of waterways. He proposed also to show that deep waterways are essential to successful railroad operation in relieving the roads of their non-productive freight, and in stimulating industries and population. To demonstrate this, he gives a list of 14 railroad companies, the shares of which were quoted in New York, Sept. 16, at from $101 up to $265. This list includes the New York, New Haven & Hartford; the Old Colony; the Boston & Providence; the Boston & Albany; Chicago & Northwestern preferred; St. Paul preferred, etc. He gave also a list of 21 railroads having no competing waterway, the shares of which were quoted from 1⅝ up to 128. This included the Atlantic & Pacific and so on up to the Great Northern. The distinction made in his lists as between railroads having competing waterways and those not having them is a little arbitrary, but the argument has just as much value for all that, and of course the logical conclusion is that transcontinental railroads should at once be paralleled by canals. In other words, Professor Haupt has discovered that in the wisdom of Providence great rivers flow past large cities.

A TYPE OF VESSEL TO NAVIGATE FRESH AND SALT WATER.

Mr. Joseph R. Oldham, of Cleveland, O., had a paper under this title. He says that he thinks he could design a large screw steamer that would answer fairly well for combined ocean and lake trade. It would necessarily, however, be a compromise between the typical ocean and lake steamers. For instance, in the manner of loading and unloading, the arrangements on the lake are the most efficient in the world and are generally dissimilar to the common arrangements for doing like work in Europe and elsewhere. In structural strength he knows of no lake steamer that is strong enough for the fall and winter trade, say between New York and the British Isles, although a small steamer like the Pathfinder might do fairly well if she had a surface condenser, about 20 per cent. more horse power, half a dozen steam winches, masts, derricks and sails.

As soon as the deep waterway is opened to the ocean, the lake steamers will have to compete with foreign vessels, and the first cost of construction will be an important factor, for, in addition to the effect of more or less capital invested in the enterprise, there is the continuous expense of insurance, which is one of the heaviest items in the disbursements of a cargo steamer. The following table shows the total cost of working six ocean steamers for one year:

Crew, wages and provisions	$69,000
Port charges	55,000
Stores, docking, painting, etc	51,000
Insurance	45,000
Loading and discharging	40,000
Bunker coals	35,000
Brokerage and commission	20,000
Total disbursements	$315,000

The gross receipts of these six steamers amounted to $350,000, the profit being 10 per cent. a year, with no allowance for depreciation. It will be observed that with the high efficiency of foreign steamers the bunker coals are less than the cost of insurance. Hence it is important to keep down the first cost of a vessel.

A modern Atlantic cargo steamer should be about 450 ft. long, 50 ft. broad and 34 ft. deep, and carry 8,500 tons dead weight on 26 ft. draft of water. The draft would he too great for trading on the lakes. She could not be made shallower and broader because the cheapest type of a ship is a deep one and the dearest a broad one. Moreover, broad and shallow vessels are expensive to propel. If it were required to carry the same dead weight, 8,500 tons, on 20 ft draft, the vessel would have to be 520 ft. long and 57 ft. beam, which would augment the first cost about 20 per cent; that is, if the proposed steamer cost $300,000, the alternate shallow vessel would cost about $360,000. On the other hand, if the proposed length and breadth are considered sufficient for the lakes with 20 ft. of water the carrying capacity would be reduced from 8,500 to 6,500 tons. It follows that, if the lake steamers are to compete with foreign vessels, the economical steamer for combined lake and ocean trade should be large and deep, and a large proportion of her cargo would require to be shipped at a deep water ocean port or at the east end of Lake Erie if the new canal permits vessels drawing about 26 ft. of water to pass through it. This would not involve breaking bulk, as the final load could be carried between decks or in separate holds, a not uncommon practice in many trades. This combination steamer should have the boilers located as they generally are on lake steamers, but the strength of the engine and boiler houses should be more than double.

Our lake steamers have greater register tonnage in proportion to their carrying capacity than any class of steamers in the world, while some types of British steamers have the lowest register tonnage, which would severely handicap the lake vessel in competition.

One advantage of a deep channel to the sea would be that the lake steamers could work all the year. "When a good lake steamer is water-borne to the ocean, her sphere of operation becomes unlimited, but it must be remembered that Brown hoists, steam cranes, floating coal cars, elevator legs and ore chutes may all be wanting in many Pacific and Atlantic ports, and in the islands of the sea. Masts and booms are a necessity in the foreign trade, and sufficient sail should be carried to keep the vessel out of the trough of the sea in a breakdown. With our lake steamers thus furnished and equipped, and supported by the unlimited credit of the country and by the prestige assured to all that floats under the stars and stripes, Superior, Duluth, Buffalo, Chicago and Cleveland may soon become marine emporiums more rich and famous than Alexandria or Carthage, Liverpool or New York have ever been or ever can be."

REGULATION OF LAKE LEVELS.

Mr. George Y. Wisner, of Detroit, presented a paper under the title of Regulation of Lake Levels with Reference to Improving Waterways. He said that the cost of increasing the depth of lake waterways to 20 ft. has been about $1,500,000 for each foot and for the principal lake harbors about $3,000,000 per foot. The permanent deepening of the harbors and waterways may be safely considered worth $4,500,000 for each foot in depth obtained. The importance of any slight change in the lake levels is "illustrated by the criticism by literary engineers on the deepening of the channel of Lime Kiln crossing in the Detroit River whereby a lowering of the water surface of the river one half an inch may have been produced, but it is strange that variations of several feet, due to natural causes, have received no official attention with reference to their amelioration and have met with bitter opposition whenever any attempt has been made to secure an investigation of the feasibility of such improvements." The fluctuations of the water levels of the lakes amount to about 5 ft. on lakes Michigan, Huron and Erie. These variations may be materially reduced, thereby increasing the low water depths of all the lake channels and by rendering such depths nearly constant secure much greater economy in vessel construction and transportation. A well devised system of regulation which will reduce the range of levels to 1 ft. or less will increase the low water depth of all channels 3 ft. and fix the draft for which vessels may be built to carry full loads through the season. Two different methods have been advocated for doing this; first, to make a regulating reservoir of Lake Superior and its tributaries, and second, to regulate the level of Lake Erie by a submerged dam near its outlet. With the data now available it is impossible to say definitely what may be accomplished by either of these plans or what they would cost, but enough is known to enable us to say what may be expected from the execution of one or both of these plans, and to conclude whether such an undertaking is worth official investigation.

The supply from the regulating dams of Lake Superior alone would have little effect in checking the fall of the water surfaces of the lower lakes, but to get any substantial benefit from the regulating works at the foot of Lake Superior, the level of Lake Erie must first be regulated by a dam at the head of Niagara River. Such a dam could be built, but what its dimensions should be and what it would cost cannot be known until the discharge of the Niagara River is accurately known.

Such a dam will be ample to regulate the levels of lakes Erie, Huron and Michigan, but if future development of lake ways makes further improvements necessary a regulating dam at the foot of Lake Superior would place the levels of the entire upper lake waterway system under perfect control.

The paper is a very carefully reasoned document, and we regret that we cannot give more of it. We have given above only the author's conclusions as to regulation. As to the importance of this matter of regulation he says:

Cheap transportation depends largely on being able to carry large quantities of freight in full loads, long distances, without change and at rapid speed. To do this, ships must be constructed with due regard to the depths of the waterways which they are to traverse, and since the capacity of a waterway within ordinary limits varies as the cube of the depth, the draught of vessel must be such as to utilize as great a depth as possible, without causing speed to be retarded by too close proximity of keel to the bottom.

For waterways of constant depth, the most economical draught and tonnage for a vessel is easily determined, but where the water levels have fluctuations of several feet, the solution is very complicated and unsatisfactory.

On the lakes, freight vessels have generally been constructed for the deepest summer depth to be expected in the waterways, with the result that during low stage of water only partial loads can be carried, which, with detentions from groundings, greatly reduces the profits of the shipping business. It would, therefore, seem almost self-evident that any system of improvement of our harbors and waterways, having for a basis the regulation of the water levels, must have a very beneficial effect in cheapening vessel construction and transportation rates.

It is a well established fact that the tendency of export products is to follow the same lines of transportation used for supplying the necessities of home consumption. The surplus products of the Northwest will therefore very likely continue to be transported over the water and railroad routes through our eastern cities.

This convention has been convened to devise ways and means to render the cost of such transportation a minimum by setting the proper machinery in motion to have a waterway of a fixed depth of over 21 ft. constructed from the lakes to tidewater; but unless some radical change is made in the methods of improving the waterways of the lakes, vessels loaded for the full navigable depth of such ship canal will be badly handicapped when chartered for ports beyond the western terminus of the canal during the low water season on the lakes. It has already been shown that the cost of increasing the harbor channels and lake waterways has been nearly $5,000,000 for each foot in depth secured in both, and that under the present system of improvement such results have not been permanent. It would therefore appear very desirable that an investigation be made of the feasibility of increasing and rendering nearly constant the depth of navigable channels of the lakes by regulating the lake levels, and that such investigation should be made by the International Commission to be appointed and, I understand, already provided for, to report on the character, route and cost of a ship canal from the great lakes to the sea.

Several other papers were presented which we may consider in a later issue. The following resolutions were adopted:

1. That the public welfare demands the deepest practicable channels between the several lakes and to the seaboard to enable vessels of the most economical type to pass between

lake ports or between the lakes and the seaboard, or to foreign waters, without the necessity of trans-shipment.

2. That the said requirements call for at least a depth of 21 ft. in all channels, and the building of all permanent structures for a navigable depth of 26 ft. or more in order that the watercourses may be progressively and economically deepened to the ultimate necessities of traffic.

3. That the prompt action taken by the Congress of the United States and the Government of the Dominion of Canada providing for a joint commission to investigate and report upon the establishment and maintenance of deep water between the great lakes and the sea, conformably to the resolutions adopted at Toronto in 1894, is a matter for gratification, and that in view of the extended scope and great importance of the subjects for examination this convention urges that the most liberal provisions be made for the necessary expenses.

4. That the broadening of the channels through the connecting shallows between Lakes Erie and Huron and between Lakes Huron and Superior, as recommended by the Lake Carriers' Association, is urgently demanded by the present interests of commerce and is in line with the progressive developments of a trunk water route.

5. That the international interests in the great fresh water seas of the American continent and in the ship routes joining them to the ocean is recognized, and that the use of their waters and the control of their levels are proper subjects for international regulations.

6. That pending the development of the best deep channel, or channels, to the ocean, the promised early completion by the Canadian Government of the St. Lawrence canals, if possible, with lengthened locks, will result in marked benefit to international commerce and the producers of the interior; and that likewise the movement in the State of New York toward lessening the cost of transportation to tidewater by improving the Erie Canal, which must have a permanent value, is noted with satisfaction by this convention.

7. That with respect to the several resolutions in regard to local projects all enterprises designed to extend maritime commerce through lateral routes tributary to the great lakes water system are to be encouraged.

8. That this convention calls special and renewed attention to the desirability of establishing a permanent international court as set forth in the organizing convention at Toronto in 1894.

The following officers were elected:

O. A. Howland, Toronto, International President; L. E. Cooley, Chicago, United States Vice-President; James Fisher, Winnipeg, Canadian Vice-President. Executive Board: A. J. Crocker, Minneapolis; F. A. Flower, Superior, Wis.; Captain J. S. Dunham, Chicago; James Connell, Port Arthur; H. E. Seymour, Sault Sainte Marie; R. H. Dobell, Quebec; T. H. Canfield, Burlington, Vt.; D. M. Smith, Toledo; S. Stephenson, Menominee, Mich.; E. C. O'Brien, New York; A. P. McGuirk, Davenport, Ia.; E. V. Smalley, St. Paul; A. H. Burke, Duluth; Don M. Dickinson, Detroit; Ryerson Ritchie, Cleveland; F. J. Hearne, Wheeling; G. H. Anderson, Pittsburgh.

The La Burt Underground Conduit.

The accompanying engravings show a new and ingenious form of underground conduit, invented by Mr. John La Burt of Brooklyn, engineer of the La Burt Electric Railway Co., of 123 Liberty street, New York.

The system has the slot at one side, after the form adopted by the well known Buda Pesth road. This plan utilizes the rails in forming the conduit, and does away with the heavy and expensive yokes used on many conduit lines. The conduit is thus small, and this might prove a disadvantage, were it not for the fact that the underground conductor does not carry current except when the car is directly over it, thus greatly reducing the chances of leakage. However, the conduit is properly

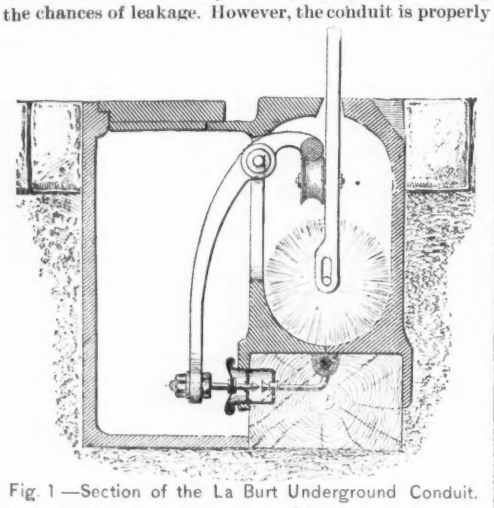


Fig. 1.—Section of the La Burt Underground Conduit.

drained, being tapped to sewers at intervals, and may be cleaned by a brush attached to the trolley of each car as shown, if so desired.

The conduit is 8 in. wide and is formed of two specially rolled rails, 12 in. deep, shown in Fig. 1. This represents a section of the conduit through a junction box, such boxes 16 in. × 16 in. being placed at the joints in the conductor. The underground trolley carries two trolley wheels, which wheels travel on a round metal conductor of large diameter, made of a brass pipe, enclosing a core of clay or some such material, to give the necessary solidity and weight. This conductor is in sections, insulated from each other at their ends by a flexible joint. They are supported by the bell crank shown in Fig. 1, placed at each junction box, and pivoted as shown. The trolley wheel raises one arm of the supporting lever, thus forcing the other arm in toward the small porcelain lined iron cup 4 in. × 6 in. shown at the side of the stringer. This throws in the plunger and completes the circuit. The contact points are platinum. After the car passes, the weight of the conductor begins to depress the lever arm and to withdraw the plunger from the cup, breaking the connection. The length of the sections of the conductor allows one end of it to sag and break the connection while the other end is held up on the trolley wheels. The cup is closed with a flexible rubber cover and has a mica shield midway of its length, to prevent sparks from reaching the rubber and burning it.

The current is carried on a copper cable imbedded in the wooden stringer as shown. Connection up through the lever arm to the conductor is made by a wire inside the lever arm, to avoid any chance for leaks.

One important point of superiority claimed for this system, is its positive action in making and breaking the circuit, a feature not always possessed by those systems whose success is dependent upon the action of electro-magnets, with their tendency to get out of order. Those interested in the conduit propose to construct it for $15,000 a mile, which is an exceedingly low price, if

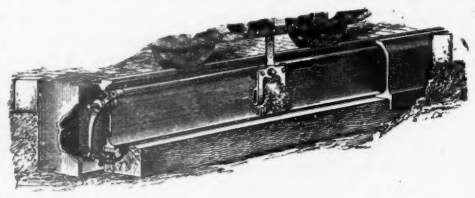


Fig. 2.—The La Burt Conduit—Outside Rail Removed.

the result is, as seems probable, an efficient and durable line. This will be brought out by subsequent trials. It is said that the system will be placed on an electric line of considerable length during the coming year.

Train Accidents in the United States in August.

COLLISIONS.

REAR

2d, 2 a. m., on Pittsburgh, Fort Wayne & Chicago, near Canton, O., a freight train descending a grade broke in two, and the rear portion afterward ran into the forward one, wrecking ten cars. In the last car of the forward portion of the train there were 13 tramps; two of these were killed and 5 badly injured.

5th, on Southern Railway, at Haw River, N. C., a mixed train ran into the rear of a preceding freight, wrecking the caboose. A passenger in the caboose was badly injured.

11, on Baltimore & Ohio, at Cameron, W. Va., a freight train ran into the rear of a preceding freight, wrecking 2 engines and 8 cars. One engineman was killed.

13th, 1 a. m., on Northern Central, near York Haven, Pa., a freight train broke in two and the rear portion afterward ran into the forward one, wrecking 10 cars, most of which fell into a creek. One brakeman was injured.

14th, on New York & New England, near Pomfret, Conn., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking 17 cars. Three tramps were killed and a brakeman injured.

15th, 8 p. m., on Camden & Atlantic, at Liberty Park, N. J., a passenger train standing at the station was run into at the rear by a following passenger train, wrecking a part of the rear car. One passenger was killed and 35 injured, most of the injuries being slight. The car took fire from the headlight of the engine and was mostly burned up. The following train had been admitted to the block section wrongfully, the signalman at Collingswood having acted on a telegraphic report which was not intended for his office. This collision was reported in the *Railroad Gazette* of Aug. 30.

16th, on Chicago & North Western, near Aurora, Ill., a passenger train ran over a misplaced switch and into some freight cars standing on the side track. Ten boys were standing on the freight cars; one of them was killed and 5 were injured by sulphuric acid with which the car was loaded.

18th, 2 p. m., on Lehigh Valley road, near Three Bridges, N. J., a freight train running at high speed ran into the rear of a preceding freight, wrecking the caboose and 6 cars. The conductor, said to have been asleep in the caboose, was killed.

18th, on New York, Ontario & Western, near Oneida, N. Y., a freight train ran into some freight cars which had been blown out of a siding by a high wind, making a bad wreck. One fireman was killed and two other trainmen were badly injured.

21st, on New York & New England at Reynoldsville, N. Y., a passenger train ran over a misplaced switch and into the rear of a freight train standing on the side track, wrecking the engine, express car and 3 freight cars. Four trainmen were injured.

24th, 11 p. m., on Rome, Watertown & Ogdensburg, at Pulaski, N. Y., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking 13 cars. A tramp was killed and 2 others injured.

25th, on Chicago, Burlington & Quincy, at Edgemont, S. D., a freight train ran over a misplaced switch and into another freight, wrecking 6 cars. A brakeman was killed.

27th, 4 a. m., on San Antonio & Aransas Pass., near Runge, Tex., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, derailing four cars. One brakeman was killed and another injured.

And 15 others on 12 roads, involving 4 passenger and 23 freight and other trains.

BUTTING.

3d, 2 a. m., on the Baltimore & Ohio, at Norwich, O., butting collision between an eastbound passenger train and a westbound freight, wrecking several cars. The wreck took fire and the whole of the passenger train, except one sleeping car, was burned up. The freight train had been delayed in ascending a steep grade and the engine had been to the summit and set off some cars. At this point a flagman was left to stop the passenger train, but he used no torpedoes and, the night being foggy, it is said that the engineman of the passenger train failed to see his lantern. The fireman was killed and the engineman fatally injured.

8th, 6 a. m., on Boston & Maine, near Plymouth, N. H., butting collision between a southbound passenger and a northbound freight train, wrecking both engines. One engineer and both firemen were killed, and 2 passengers and 3 trainmen were injured. The freight train was in charge of a new engineer, who was accompanied by a pilot, but the conductor and the pilot both forgot about the passenger train.

27th, on St. Louis & San Francisco, at Sullivan, Mo., butting collision of freight trains, due to a misplaced switch. Two drovers were killed.

And 3 others on 3 roads, involving 1 passenger train and 4 freight trains.

CROSSING AND MISCELLANEOUS.

8th, on Great Northern, at Great Falls, Mont., collision of freight trains, switching in the yard, killing a brakeman.

8th, 11 p. m., on Metropolitan Elevated, at Laflin street, Chicago, a locomotive ran over a misplaced switch and into a standing passenger car, badly injuring 2 oilers who were under the car.

15th, on Southern California, near Santa Ana, Cal., 5 cars escaped from a switching engine and ran down grade toward San Diego; they met a locomotive and collided with it, making a bad wreck; conductor and engineer injured.

19th, 1 a. m., on Long Island road, at Morris Park, N. Y., an engine standing on the main track unlighted and unattended, was run into by another engine and one employee was injured. The unattended engine was started by the shock and ran to Jamaica, where it was burned upon a siding and ran against a brick wall, which stopped it.

And 15 others on 12 roads, involving 4 passenger and 25 freight and other trains.

DERAILMENTS.

DEFECTS OF ROAD.

3d, on Baltimore & Ohio, near Cochran's Mill, Pa., a freight train was derailed and the engine and 9 cars fell down a bank. The engineer was killed and the fireman badly scalded. It is said that the cause was a broken rail.

9th, on Fremont, Elkhorn & Missouri Valley, at Crowell, Neb., a passenger train was derailed by a defective switch and the cars ran against a freight car standing on a side track. One passenger was fatally injured.

9th, on Peninsular Railroad, near Shelton, Wash., a freight train loaded with logs fell through a trestle which had been weakened by fire and the engine and many cars were completely wrecked. The fireman and two men riding on one of the cars were killed and three trainmen were injured.

19th, 4 a. m., on New York Central & Hudson River, near Nehasane, N. Y., a passenger train was derailed at a point where the roadbed was insecure by reason of recent heavy rain. One trainmen was injured.

26th, on Fort Worth & Denver, near Rhome, Tex., a passenger train was derailed at a defective switch and the engineer and fireman were badly injured.

DEFECTS OF EQUIPMENT.

5th, on Fitchburg road, near Conway Junction, Mass., several cars of a freight train were derailed by the falling of a brakebeam; the conductor was injured.

10th, 1 a. m., on Cleveland, Cincinnati, Chicago, & St. Louis, at St. Paul, Ind., a freight train was derailed by the breakage of a drawbar and 8 cars were wrecked. In one car were 10 tramps, of whom one was killed and five injured.

27th, on Lake Shore & Michigan Southern, at Otis, Ind., a freight train was derailed by a brakebeam which fell upon the track, and 8 cars were wrecked. A tramp was injured.

31st, on Pennsylvania road, near Huntingdon, Pa., a freight train was derailed by a broken axle and 20 loaded cars were wrecked. A brakeman was killed.

And 4 others on 4 roads, involving 1 passenger train and 3 freight trains.

NEGLIGENCE IN OPERATING.

3d, on New York Central & Hudson River, near Craryville, N. Y., a passenger train was derailed by a misplaced switch and the engine was overturned. The engineman and fireman were pinned beneath it for nearly two hours; the engineman was killed and the fireman badly injured.

9th, on St. Louis, Chicago & St. Paul, at Curran, Ill., a freight train was derailed by a derailing switch and 4 cars were overturned. Five employees were injured.

13th, on Northern Pacific, at Almira, Wash., a freight train was derailed by a misplaced switch and the engine and 12 cars of cattle fell down a bank. The fireman was killed and the engineer and 6 drovers were injured.

15th, on St. Louis Southwestern, at Stamps, Ark., a passenger train was derailed by a misplaced switch and the engine and first two cars fell down a bank. Five trainmen were injured.

20th, 6 a. m., on Cleveland, Cincinnati, Chicago & St. Louis, near Lawrenceburg, Ind., a passenger train was derailed by a misplaced switch and the engine and several cars fell down a bank. The engineman was killed and the fireman was injured.

21st, on Alabama Midland, at Alexanderville, Ga., a pay car train ran over a misplaced switch and into a sawmill, wrecking the engine and the mill. A man in the sawmill was fatally injured and the engineer and fireman were badly scalded.

And 4 others on 4 roads, involving 2 passengers and 2 freight trains.

UNFORESEEN OBSTRUCTIONS.

1st, on the Rio Grande Western, near Wolcot Colo., one of the two engines of a passenger train was derailed by a rock which fell upon the track from a high cliff a moment before the engine reached the point. The engineman and fireman escaped, but the engine was overturned and fell into the Eagle River. The train was running slowly, and the second engine was not derailed.

4th, on Philadelphia & Reading, near Kimberton, Pa., a passenger train was derailed by running over a cow and several cars fell down a bank. The engineer was killed and the fireman and 6 passengers injured.

7th, on Atlantic & Pacific, at Mitchell, N. M., a passenger train was derailed by a washout and 4 cars were ditched. One passenger was killed by jumping off and 5 passengers were injured.

10th, on Hutchinson & Southern, near Rago, Kas., the engine of a mixed train was derailed by sand which had been washed upon the track, and one car was ditched. A fireman was injured.

22d, 2 a. m., on Norfolk & Western, near Pamplin's, Va., a freight train was derailed by a log which had been dropped on the track at a street crossing, and ran against a work train standing on a side track near by. The freight engine was overturned and the engineer and fireman were killed. Twelve cars were wrecked.

25th, on Great Northern, near Richmond Beach, Wash., the engine of a passenger train was derailed by a landslide and the engineer was killed.

27th, on Colorado Midland, near Fisher, Col., a passenger train was struck by a large rock which fell from the mountain side as the train was passing. The baggage car and smaking car were wrecked. One passenger was killed and 2 injured.

30th, on Ohio River road, at Portland, W. Va., a freight train was derailed at a switch which had been maliciously misplaced, and the engine and 10 cars fell into the Ohio River. The fireman was badly injured. Two men were arrested for the crime the next day, one of them being an agent recently discharged. They are also accused of having set fire to the station building, which was burned up.

And 7 others on 7 roads, involving 4 passenger and 3 freight trains.

UNEXPLAINED.

6th, on Norfolk & Western, near Ford's, Va., a freight train was derailed and one passenger injured.

11th, on Ohio Southern, near Bainbridge, O., a freight train broke through the bridge over Paint River, and the engine and 20 cars fell about 50 ft. to the bottom of

the river below. The engineer, fireman and one brakeman were drowned.

15th, 11 p. m., on Atchison, Topeka & Santa Fe., at Temple, Tex., a switching engine running at considerable speed was derailed. Two men riding on the front foot board were run over and killed.

17th, on Kansas City, Fort Scott & Memphis, near Fort Scott, Kan., the baggage car of a passenger train was derailed. Two passengers and one trainman were injured by jumping off.

18th, midnight, on Southern Railway, near Toccoa, Ga., a passenger train ran off the track while running at high speed on a sharp curve and the tender and express car fell down a bank and were wrecked. The express messenger was killed.

21st, on Chicago, Rock Island & Pacific, at Atlantic, Ia., a passenger train was derailed and one car was ditched. One passenger was injured.

23d, on Atlantic City Railroad, at Winslow Junction, N. J., a freight train was derailed and the fireman was injured.

29th, on Cleveland, Cincinnati, Chicago & St. Louis, near Fithian, Ill., a car in a freight train was derailed and the caboose was wrecked. Three railroad men "looking for work," who were in the caboose, were injured.

30th, on Southern Railway, near Pope's Ferry, Ga., an excursion train of 9 cars was derailed and several cars were wrecked. Two passengers were killed and 8 injured.

30th, on Pittsburgh, Shenango & Lake Erie, near Erie, Pa., a freight train was derailed and the engine fell down a bank. The engineman was killed and a brakeman was fatally injured by jumping.

And 23 others on 21 roads, involving 4 passenger and 19 freight and other trains.

OTHER ACCIDENTS.

3d, on New York, Ontario & Western, near Middletown, N. Y., the locomotive of a freight train was wrecked by the explosion of the boiler. The engineman was killed and the fireman badly injured.

4th, on Chesapeake & Ohio, near Hinton, W. Va., a car in a passenger train was damaged by a large stone which fell from a high bluff just as the train was passing and crashed through the roof of the car.

13th, on Manhattan Elevated, at the City Hall station, New York City, a passenger train approaching the station was not properly controlled and ran into the bumping block at the end of the track. Three passengers were injured.

22d, on Central of New Jersey, near Bloomsburgh, N. J., the roof of a car in a freight train became detached and fell against the cab of a locomotive on an adjoining track, and the fireman was badly injured.

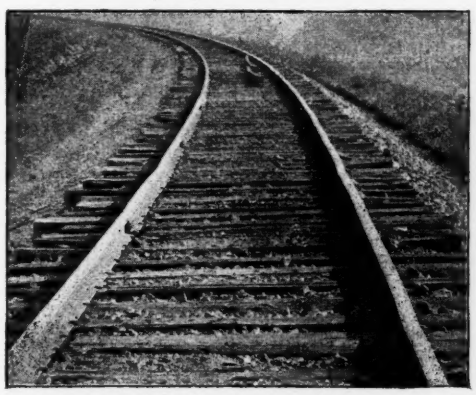
22d, 11 p. m., on Northern Pacific, near Butte, Mont., a car in a passenger train was badly damaged by an explosion of dynamite which had been maliciously placed upon the track. One passenger was injured. Nearly the whole of the train passed over the dynamite before the explosion.

And 3 others on 3 roads, involving 3 passenger trains.

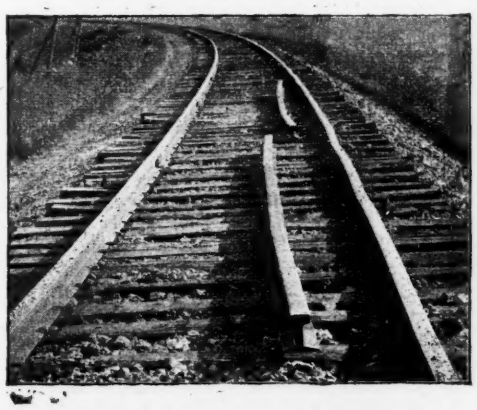
A summary will be found on another page.

More Bent Rails.

We are gradually accumulating quite a museum of pathological specimens illustrating the effects of locomotive driving wheels on rails. The illustrations which we now show are from photographs taken of a bit of



track on a middle western railroad, over which a heavy locomotive was hauled at about 50 miles an hour, with side-rods down. The vertical bending of the rails is well shown in both the pictures. In fact, we have seldom seen a case in which so many kinks were introduced. The lateral bending is shown by the two rails taken out of track and placed alongside for the purpose



of photographing. It is quite likely that some of the rails now in track would show the same lateral bending if the spikes were drawn, allowing them to spring.

A Pair of Big Cast Steel Couplers.

The accompanying cut is a reproduction of two couplers made by the Sargent Company, of Chicago, for a private car on the Chicago, Rock Island & Pacific. This car was to be used for a long trip, and two couplers were needed that could be used with the Miller hook draft rigging on it. They were made of crucible steel, and are 68 in. long from the inner face of knuckle to the end of tail piece. The Columbia coupler head was used, and an extension cast on, which is 5 in. square at the end of the regular M. C. B. design, and tapered to 4 in. square at the extremity of its tail. This extension is $\frac{5}{16}$ in. thick

A Cast Steel Coupler.

on the sides and $2\frac{1}{8}$ in. thick at the end, which was cored out for a $1\frac{7}{8}$ in. hole for the tail bolt. The couplers were perfectly satisfactory and needed no straightening. The weight of each coupler is 574 lbs.

The Influence of Vibration on Steel.

Hitherto it has almost invariably been assumed that the softer a bar of steel was the more likely was it to endure strains and shocks causing vibration. Steel is a metal of anomalies and surprises, and recent investigations carried out by Mr. W. Metcalf appear to show that popular opinion is wrong, and that the hard steels suffer less from vibration than the soft steels. Mr. Metcalf's attention was first called to the matter by the constant breakage of steam hammer piston rods. These, made of ordinary steel, lasted but six months, an iron rod breaking in half that time. Then lower and lower steels were tried and broke in about five months. An accident caused the hurried use of a rod made of comparatively high steel; it was assumed that it would not last more than a week or two, but it actually held out for more than two years. Subsequently a lot of small steel connecting rods were tested in a special machine. The test required was that a machine should run four and a half hours, at a rate of 1,200 revolutions per minute, unloaded, before the connecting rod broke. These rods were unforged in the middle, and consisted of a piece of straight round bar with a head welded on each end, the middle of the piece being left as it came from the rolls. This explanation is necessary in order that it may be understood that no accident of forging affected the results. "The mode of rupture was," says Mr. Metcalf, 'as a rule, the same in all cases; the rod heated at the middle, where the vibrations met, as they were imparted by rotary motion at one end and by reciprocating motion at the other, and by alternating strains of compression and extension. In some cases the rod became slightly red hot at the middle before rupture. After heating, the next thing observed was the raising or loosening of the surface scale of the middle. Soon after this rupture began, first at the surface and gradually extending to the center, until finally the rupture took place. The breaking was gradual in every case, no piece breaking suddenly, even of the highest steel. The first trial was with .53 carbon steel—mean time of six trials, two hours nine and one-eighth minutes. Second trial, .6[illegible] carbon steel—meantime of six trials, two hours fifty-seven and one-half minutes. Third trial, .85 carbon steel—meantime of three trials, nine hours forty-five minuts, and the trials were stopped." A set of 12 connecting rods, made from special ingots, was then prepared. These were tested with the following results:

The .30 C. ran 1 h. 21 min. heated and bent before breaking.
The .49 ran 1 h. 28 min.
The .53 ran 4 h. 57 min., broke without heating.
The .65 ran 3 h. 50 min., broke at weld where imperfect.
The .80 ran 5 h. 40 min.
The .84 ran 18 h.
.87 C. broke in weld near the end.
.96 C. ran 4 h. 55 min., and the machine broke down.

Bridge Deflections.

In the *Journal* of the Association of Engineering Societies for June, 1895, appeared an article on bridge deflection by M. A. Howe, member of the Engineers' Club of St. Louis. The paper has been reprinted in a pamphlet and seems to us a valuable one, for the data or dimensions and weights of the moving loads, and their position at the moment of maximum deflection are recorded with great care. The experiments were made on two railroad bridges of about 122 ft. and 164 ft. span, respectively, being the west span of the Vandalia bridge over the Wabash River at Terre Haute, Ind., and the east span of the "Big Four" bridge over the Wabash at the same place. The depth of the trusses of the first bridge is 26 ft., the panel length 20.5; the depth of the second is 24 ft., the panel length 17.5 ft. Automatic continuous diagrams were made recording, for the point of the bridge considered, the actual vertical, lateral and longitudina motions independently; seconds of time; the instant each wheel entered the span, passed over the point considere l and left the span. A specially designed device was used in obtaining these data, which differs from those generally used in that such devices usually record the movements as arcs of circles and do not separate them as was done in this case. The machine is rigidly connected to the bridge, which is a peculiarity of the device.

The principal value of such experiments is in the determination of the relation of the actual stresses and deflection in bridges to those determined by the theoretical formula used in bridge computation, since such experiments may point out changes that might be made in the computing formula to the benefit of the structure. Comparing the actual and theoretical deflections for both bridges it was found that the actual was very much smaller than the theoretical obtained by Professor Johnson's formula $\frac{p\,u\,l}{E}$. This formula assumes that the bridge is pin-connected and that each member of the truss is independent and connected to it only by pins. The author objects to the fact that this assumption is not true, and questions the correctness of the formula for the two bridges concerned. If the assumption gives results greater than those obtained in practice it would seem o err on the side of safety, which is not by any means undesirable. As the author says, the continuity of the stringers makes the panel loads less than those which are assumed in calculations, and thus the stresses in the main truss members, and the theoretical deflection are correspondingly affected. He concludes that there is no indication of injurious stresses in the main truss members due to vibration produced by the moving load. Further, that for bridges similar to those examined, it does not seem necessary to add any material to the main truss members on account of impact, as is usually done. The suggestion is made that a heavy and rigid floor system, or a flexible floor hung to the chord pins, would consume all impact before it reached the main trusses.

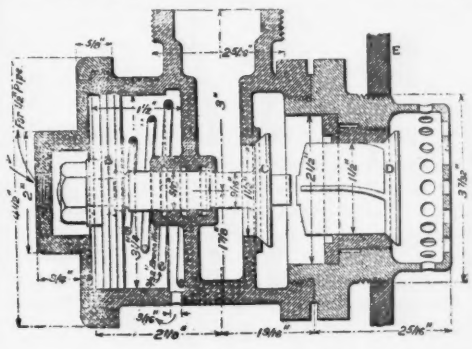
The record of the side motion indicates lateral weakness. This motion is caused by the lateral motion of the engine and cars, the ordinary wind lateral bracing being too light to withstand this tendency.

Considerable valuable work could be done in this field of experiment by obtaining data for bridges of widely varying sizes and types and making comparisons between the results thus obtained.

A Pneumatic Blow-off Cock.

In the accompanying illustration is shown the pneumatic blow-off cock invented by Mr. William McIntosh, Master Mechanic of the Chicago & Northwestern Railroad at Winona, Minn.

It is made entirely of brass, and consists of three parts besides the valves, piston, etc. These parts form the body of the cock, and are screwed together, as shown in the sectional view. The piece perforated on the end with ¼-in. holes is screwed into the water leg of locomotive boilers, as seen in the engraving. Connection between the cock and the air-brake system is made at *A* with a ½-in. pipe. The pressure of the air when admitted comes on the piston *B* and moves it forward from the position shown in the figure. This unseats the valve *C*, and this in turn acts on valve *D*, which allows the escape of the water in the boiler. The difference in area between piston *B* and valve *D* permits an air pressure less than the boiler pressure of the steam to open the valve *D*. On releasing the air, valve *D* is seated again by the pressure within the boiler, and *C* by the action of the spring which is shown. The reason for making separate valves *C* and *D* is to prevent blowing off the boiler should the cock be accidentally broken off. Should this occur, the portion containing *D*, being inside the boiler, will not be harmed, and no water can escape. This valve is being quite extensively used in the Chicago & Northwestern Railroad, and is now manufactured and sold by the Jerome Metallic Packing Company of Chicago, Ill.



A Pneumatic Blow-off Cock.

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.

Published Every Friday

At 32 Park Place, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Last April we gave an account of the decision by Justice Williams, in the Supreme Court of Pennsylvania, as to the rights of street railroads on the highways of that state. The article will be found on page 220 of the current volume. The decision was, in brief, that no powers of eminent domain had been conferred by the Pennsylvania laws upon the street railroad companies; that the general law relating to such corporations, which was passed in 1889, was intended to bring together the valuable provisions of previous acts, but did not extend the rights of the companies. The attempt to convert city railroads into long lines of transportation was not anticipated or provided for by the legislature. When land is taken by cities and boroughs for streets and highways the easement acquired by the public is for passage only. The owner is entitled to the possession of his land for all other purposes. The occupation of a highway for a street passenger railroad is an urban servitude to which suburban property has not been subjected by law up to this time. Supervisors of townships have no right to bind private property or subject it to a servitude for the benefit of any person or corporation other than the township and the public it represents. The carriage of passengers by rail through the township on their journey from one city or borough to another is not a township purpose. The street railroad companies cannot reach the property owners either through the local authorities or by the right of eminent domain. These owners must be dealt with individually, and their rights cannot be taken away by condemnation proceedings. This, in short, was the interpretation of the laws of Pennsylvania on this subject.

We have just received a brief report of a case decided by a Master in Chancery appointed by the Court of Common Pleas of Lebanon County, Pa., sitting in equity. There were two cases. The first was brought by Henry S. Heilman against the Lebanon & Annville Street Railway Co. In July, 1891, Mr. Heilman filed his bill alleging that he is the owner in fee simple of certain lands over which is constructed the Berks and Dauphin turnpike and that the turnpike has a mere right of way over such lands; that the corporation defendant was about to construct an electric railroad over the land in defiance of his notice not to do so; that the corporation has not paid him or offered to pay him any compensation for taking his land. He prayed for an injunction. July 18, 1891, a preliminary injunction was granted, which was shortly dissolved at the cost of the plaintiff. Afterward Mr. Heilman's bill was amended so as to attack the right of the trolley company to build any road there at all. The Master arrives at the general conclusion that the street railroad company is operating its street railroad on the Berks and Dauphin turnpike on and along the lands of Henry S Heilman and others, without the authority of law, and that such an unlawful act is a continuous and a continuing trespass; that the only course open to the court is the awarding of a mandatory injunction compelling the removal of the railroad, which the Master recommends should be entered and made. A second case entered by Henry S. Heilman and others was of similar nature, and a precisely similar decision was reached. Of course appeal can be taken to the County Court and thence to the Supreme Court of the state, but, as we have noted above, the decision of the Master is directly in line with the theory announced by Justice Williams of the Supreme Court.

The announcement of the coming meeting of the Superintendents' Society appears in another column of this paper. The list of topics is long and varied, covering maintenance of way, compound locomotives, electric motors, the handling of freight and of passenger trains, signaling and discipline. Surely, there is enough here to bring out valuable discussion. We should suppose that the topics that most need discussion, how to get fast passenger and freight trains over the road on time, ought to be started by carefully prepared papers, although we discover no suggestion that such papers are expected. The next best thing would be for the members to come armed with written lists of questions. The last meeting of the Society was one of the most profitable that it ever held, so far as we can judge, and that chiefly because numerous questions were asked about subjects concerning which the members had done considerable thinking beforehand. One of the questions suggested for discussion, that about the necessity of interlocking signals with switches before attempting to run trains by the space interval system, looks a little like a challenge to superintendents who block without interlocking, to come forward and give their reasons for indulging in such unscientific practice. We hope they will meet the challenge with figures. Blocking without interlocking *is* an imperfect scheme, and those who attempt it under the impression that it is otherwise soon find out their error; but the testimony of the operating officers of thousands of miles of single track railroad is unanimous that its badness is as nothing when compared to the evils of the time-interval system. This testimony has always been of a general nature, however, so far as it has been made public, and the person propounding the question for the consideration of the Society is entitled to more specific evidence. How much have you saved per train mile in cost of collisions, as compared with former years? How often do you find a yard engine in between two trains that are ostensibly "blocked" apart? How many times has a slip of this kind caused damage? Are you successful in drawing a distinct line between absolute and permissive blocking? Questions like these may bring out answers which will show that a poor road is much better off with an imperfect block system than with none at all.

Iron men at Pittsburgh are now complaining because the railroads have not a sufficient number of cars and engines to bring their ore from Lake Erie fast enough to meet the suddenly enlarged demand. Good use is made of what cars and engines the railroads have, but the furnace men would like to have the supply increased 100 or 200 per cent. This "car famine" is one phase of the widespread change that is being effected in the general industrial situation, in conformity to which every merchant and manufacturer prepares himself as far as possible to meet large demands in short time. Competition is so sharp and so nearly equal that the bidder making the earliest delivery gets the best contracts in a great many lines. Buildings and machinery are so *comparatively* cheap that abundant capital provides manufacturing facilities far beyond the *average* requirement. Workmen are so plenty that extra men, to promptly execute every order received, are easily gathered. With these favorable conditions the manufacturers of a given district, or in a certain line of goods, can produce enough in four or six months to meet the demands of 12 months; and, as a matter of course, they would like to have the railroads keep pace with them, to the extent of furnishing a supply of cars and engines sufficient to haul 12 months' freight in four months. The roads do not do this (although they often go farther, in the attempt to meet the conditions, than an ideal economy would allow), and so, in the general attempt to rush business, the transportation element is the first link of the chain to prove inadequate. There are reasons enough why this should be so. The railroads have severe limitations which compel them to take constant care not to provide facilities beyond the actual requirements of their customers. Omitting mention of details of construction and other mechanical items which cannot be compared with similar features of other business, on any intelligible basis, the danger that the public may permit the construction of a new road or may arbitrarily reduce rates, is sufficient to chill nearly every idea, looking to expansion of facilities, that may enter a manager's head. The railroad that builds cars much beyond the requirements of the shippers whose business it is sure of, plus the average requirements of competitive business, is pursuing a bold policy. The risk is such as to offset a number of the big dividends that legislators complain of.

Besides these general considerations the railroads in Ohio are affected by powerful factors that are more disturbing now than ever before. For two years past the coal shipments, which might be distributed throughout the season of navigation and thus produce the least practicable interference with ore and other freight, have been concentrated in the latter part of the season when all freight is at its heaviest. This has been caused principally by the strikes. In dull times such a disturbance of traffic is not utterly intolerable, but the shippers and consignees who do not suffer much by delaying their shipments become less and less careful to distribute their buisness over as long a period as possible. Then again the ore traffic itself is subject to an element of feverishness that was formerly less powerful, in consequence of a change in the rates for handling and storage at the lake ports. Ore which is transferred direct from the vessels to the cars now costs about 12 cents a ton less than that which is stored on the dock, and, of course, every furnaceman wants all of his ore put aboard the cars at once. As in so many previous car-famines, the degree of responsibility to be attached to the railroads is made to appear worse than it is by statements of the number of carloads of freight waiting for shipment, as though everything would run smoothly if a few hundred cars could be borrowed. In point of fact, the furnaces are also taxed to their utmost and many furnace yards have already become clogged, producing delay and actually impeding the operations of the railroads. But the rail carriers have become as used to being blamed in matters of this kind as another carrier—the mule—has to being cussed in more personal language, and we suppose they will survive. A few years ago the grain shippers of the West complained of the lack of facilities afforded by the railroads for their export grain, and energetic measures were taken to remedy the lack; but all at once a halt was called from an unexpected source; the storehouses at the ports on the other side of the Atlantic were full.

On the Northwest system of the Pennsylvania lines west of Pittsburgh, passenger trains are now made up with the heaviest passenger cars in front, and the officers of the road say that they are well satisfied with the change. The mail and baggage cars are placed ahead, then the sleeping or parlor cars, next the dining car, and last the day coaches. The smoking car is generally the foremost of the common cars. The principal reasons for making this change will be readily understood—the desirability of getting the heaviest cars as near the engine as possible, and of having the class of cars which it is desirable to add to or diminish during the journey always at the rear, where one or more can be attached or detached without disturbing the rest of the train, and with the least delay. These reasons are more important than we sometimes think. Every one admits that to pull a half dozen heavy sleeping cars by means of a 200-ft. rope would be placing the engine at a disadvantage, especially on curves; but in a train of three sleepers of 40 tons each, and three other cars weighing 25 tons each, placing the sleepers at the rear introduces a condition something like that; that is to say, you place at a distance from the engine a portion of the load (45 tons, or 23 per cent.), which might be placed nearer by reversing the situations of the two kinds of cars. It is fair to presume that roads hauling numerous heavy sleeping cars have long since got rid of the old and very light passenger cars, with doubtful draw-gear, and underframes that used to make trouble in the front part of heavy trains, but even in the best passenger cars the frames are not as strong as in sleepers, and this change ought to result in some relief to the Pennsylvania's repair account. The expense account will probably be lightened also in two other items, fuel and wheel wear. In these, as in the other item, the waste of the ordinary plan of making up trains is mostly concealed, but since the general prevalence of the rivalry in speed that has become so nearly universal in late years, probably there are few superintendents who do not run empty cars a good many hundred miles simply to avoid the delay and inconvenience of cutting them out at division terminals. With the sleepers out of the way there will be less excuse for this. One important reason why this change should *not* be made will also occur at once to railroad men, the inconvenience to passengers at way stations, where the platforms are short. The Pennsylvania people met this difficulty at once by spending two or three thousand dollars in extending platforms. With these of sufficient length, the day-car passengers have little cause for complaint in dry weather, and those in the

sleepers who, from time immemorial, have had to alight in the ditch, ought to feel decidedly thankful. To meet the difficulty of rainy weather, where the platform is not roofed, brakemen ought to be trained to be on the alert to instruct passengers before the train stops, to go forward, so as to be able to get off as near as possible to the most available cover. This is a point that needs attention on some roads that we know of, without regard to sleeping-car trains.

Some of the Hidden Matters in Car Repair and Fuel Accounts.

At the last convention of the Master Car Builders' Association, during one of those valuable piazza sessions which are perhaps the most valuable part of the conventions, an influential member said that the repair accounts for freight cars are a handy place to bury the cost of anything that it is desirable to get out of sight. Another member added that this is equally true of coal accounts, and the same idea was brought out at the discussion on fuel saving at the Western Railway Club early this year. Very likely the realization of this fact has been one reason for the overhauling of the car repair accounts which some railroads have been making in their search for economies; and on at least four railroads that we know of, the managing officers are much alive to the fact that the coal accounts are pretty loose and they are stirring matters up in a way which will probably bring about important changes.

It is not an unheard of thing to accept poor coal, pretty nearly regardless of its quality, if the owners have a "pull," and the price is no higher than that of a good average coal. It is very likely that less of this is done now than used to be done and that more care is taken to examine coal as to quality. In some cases it is bought under a guarantee of quality that makes the price somewhat dependent on the evaporating power. On one road in the West having more than 3,000 miles of line, a saving of 40 per cent. has been made in the fuel on the main line, where the character and use of fuel has been controlled; and it is expected that equally great saving will be made on the branches as soon as the system can be extended. The fuel is examined and its use is recorded; the amount taken by each locomotive and engine crew is compared with others and when there is an apparent waste, the locomotive is examined and if found all right, the engine crew are told to do better or quit. The bookkeeping is simple and the expense small, while the saving is great. Carelessness in fuel accounts has helped to delay the introduction of compound locomotives; a five dollar bill or a box of cigars to an engine crew has often made a difference of 25 per cent. in the comparative performances of an engine, and this, as much perhaps as anything else, has led to great uncertainties as to the real value of comparative tests of locomotives in service, and has done much to make railroad men look favorably on stationary locomotive testing plants.

Carelessness in keeping accounts of car repairs has permitted the use of inferior devices and has delayed the introduction of a better material than wood for sills as it has not been known, and is not now known accurately how the amounts paid for car repairs are distributed over the different parts of the cars. That is, apart from a general idea, there is no knowledge of the relative cost of repairs for sills, draft gears, trucks, etc. If an account could be kept of freight cars as is done for locomotives, so that cost of repairs could be closely compared, many inferior details would be discarded. As it is, the same old designs go in the new cars, and defects are perpetuated. When one goes through the freight yard and sees trucks loose, sagging and in bad shape he is bound to reflect that some one must pay for these repairs and that such a condition of equipment is costly, and further that all the defects are not to be attributed to service, but many should be laid at the door of the designer, for the reason that cars should be built to run without undue repairs, and such common defects as are seen in trucks and draft gear come not from the necessities of service but from failure on the part of the designer to look for new and better things.

The same is true of locomotives; wasteful engines with a "hump" in the exhaust, and delayed trains, may be the result of bad design quite as much as of undue service. And if one will compare the details of the designs of locomotives ordered by railroad companies from locomotive builders he will find that a good many of them are already antique. The railroad company, for the same money, might have got a better and more durable engine if due intelligence had been used. This is more particularly the office of a mechanical engineer on a railroad, but roads that have no mechanical engineer must either rely on the master mechanic—who is generally too busy with routine work—or on the engine builder, who may find it easier to duplicate previous orders than to get the latest improvements. As an example of this, one road recently had built some engines with boilers too small to be economical and with some details much too heavy. The weight of these engines is up to the limit, but with the same weight the material could have been disposed so that the boiler would have been more economical and the details quite strong enough. The best results are obtained when the mechanical department keeps run of what is being done on other roads and consults with the builders about each detail, taking them up singly and deciding on relative merits.

The Baltimore Tunnel Electric Locomotive in Service.

The first of the lot of four electric locomotives to be built by the General Electric Co. for the Baltimore & Ohio tunnel at Baltimore is in active service. The second one is being shipped in parts. The contract requires the engines to haul 15 loaded passenger cars and a locomotive at 35 miles an hour and 30 loaded freight cars and locomotive at 15 miles an hour through the tunnel up an 0.8 per cent. grade; the object being to keep the tunnel free from locomotive smoke, which would of course be aggravated when pulling up the grade. The tunnel is large and handsome and well lighted by incandescent lamps on the walls, and through it passes the traffic of the Philadelphia Division of the Baltimore & Ohio Railroad.

There have been some changes on the electric locomotive since it was put in service, but probably not more than might be expected from the limited experience had so far with such motors. The locomotive is now pulling all the eastbound freight trains through the tunnel, that is about 12 trains a day. Going west the trains run through without steam, the grade descending at 42 ft. per mile all the way.

The speed made with the guaranteed load is not so fast as agreed upon. About eight miles an hour is all that the locomotive is capable of making with the 30 loaded cars and a locomotive, according to the statement of the engineers on the ground. It is said that the motors will not stand the current required to haul such a train up the grade at 15 miles an hour. This is not to be wondered at when it is known that the current required at eight miles an hour is 1,500 amperes, the motors being in series so that all the current flows through all of the motors.

The locomotive is not being used now on passenger trains. The smoke clears from the tunnel between trains when pulled by steam locomotives, if the trains are not too close together, so that the freedom from smoke that could be obtained by the use of the electric locomotive is not very important. The steam locomotives on the freight trains that are hauled through make a good deal of smoke while in the tunnel and moving at eight miles an hour. An observation made recently shows that the freight locomotives hauled at a slow speed foul the tunnel as much as the passenger train locomotives running at a high speed and using steam.

The length of the tunnel run is about 1.4 miles, and the useful service of the electric locomotive is about 28 miles a day, as learned from the attendents. The cost per mile run is of course very great as it must include a heavy charge for that part of the stationary electric plant that is not needed for lighting the tunnel, yards and shops.

Whatever may be the outcome of the use of electric locomotives in the Baltimore tunnel, there is one valuable practical lesson already; there is a possibility of getting any reasonable pull with an electric locomotive. This fact will be impressed on the mind of any one who sees the machine take hold of a train of 30 cars and start them without using the slack. In the matter of speed, there is nothing about this service that is intended to show how fast electric locomotives can run. A far better example is found in suburban street car lines. It has been said in the press reports that the Baltimore electric locomotive has reached 61 miles an hour. This is quite probable, as there is sufficient power to drive the locomotive and several cars at 100 miles an hour if the motors were all placed in multiple instead of series. Speed with electric motors is largely a matter of connection of the wiring, and high speeds are generally more feasible and economical than slow speed with heavy loads.

Taken as a whole, the Baltimore tunnel engine is a very interesting mechanism, and the controller in the cab for directing the electric current is a study in details that makes a profound impression on the layman. The sparking in the overhead conductors has been reduced by using two collectors, but the rusting of the iron conductors is a continual source of annoyance. It is well worth a trip to Baltimore to see the locomotive pull a train, and the experience of the next six months with this plant may be very interesting to electricians as well as to railroad men who are looking to electric locomotives to bring back the passenger traffic which the street lines have "stolen." It may be well to say in closing, that this theft is simply an illustration of the fact that the natural public, like nature herself, follows the line of least resistance, and it is often easier and more comfortable to take the trolley car than to walk to the station and wait for a train

Prosecutions Under the Labor Laws.

There have been some recent prosecutions under the labor laws of the State of New York that are of considerable interest to employers. The Eight Hour law enacted in 1870 applied only to those employed by the state or by municipal corporations or by persons contracting with the state or such corporations. This was amended by the laws of 1894 to provide that all mechanics, working men and laborers employed on public works shall receive not less than the prevailing rate of wages, and that none but citizens shall be so employed. The Buffalo charter of 1891 provides that no man shall be employed on such works for more than eight hours in 24 consecutive hours, except in case of necessity, in which case their pay shall be at the rate of 1½ for all time in excess of eight hours.

Henry J. Warren, Superintendent of the Barber Asphalt Co., was convicted by a police court in Buffalo of a misdemeanor for a violation of this section of the Buffalo charter and punished by imprisonment. From his conviction he appealed to the Court of Sessions and to the General Term of the Supreme Court, where the conviction was affirmed, the Courts holding the act constitutional and the conviction valid. As Warren could not by law appeal to the Court of Appeals in that case, he sued out a writ of *habeas corpus* in the Supreme Court, to test the questions affecting the validity of the conviction and to inquire by what authority he was restrained of his liberty. This proceeding is a good illustration of the efficacy of the ancient writ of *habeas corpus*, for although the Special and General Terms of the Supreme Court dismissed the writ and again declared the prohibitory Statute constitutional and the accused properly convicted, yet upon an appeal to the Court of Appeals, the decisions of the lower courts were reversed and the arrest, trial and conviction declared without jurisdiction and void.

After this long and tedious fight, Warren was released, only to be arrested again for a violation of the Eight Hour law, this time for employing an alien Italian laborer. He was indicted by the Grand Jury and convicted in the Superior Court at Buffalo. His council contended that the Act in question, so far as it seemed to prohibit the employment of alien laborers upon public works was repugant to the Federal and State Constitutions and to the treaty between the United States and Italy. Upon an appeal to the General Term of the Superior Court, the act, so far as relates to the employment of aliens was declared unconstitutional and Warren was discharged.

Within a week or two the firm of Ferris & Kitto, painters in New York, were prosecuted before a city magistrate for a violation of that part of the Eight Hour law, which provides that mechanics, workingmen and laborers shall receive not less than the prevailing rate of wages. Ferris & Kitto paid $3 a day, but it was claimed that the prevailing rate of wages was $3.50. Proof was offered that the Painters' Union had fixed an arbitrary or standard rate of wages at $3.50 per day, but the Court discharged the defendants from lack of proof that the prevailing rate of wages actually paid exceeded $3 per day.

A few weeks ago, George H. Taber, a contractor painting a grammar school building, now in course of erection, was prosecuted before one of the city magistrates for paying $3 per day to his workmen, an amount claimed to be less than the prevailing rate of wages. A strike had been previously ordered upon his contract, because he refused to pay his men more than $3 per day. The strike failed, for the men voluntarily came back at the old rate. In trial of Taber before the Special Sessions, Mr. Justice Hayes presiding, it was contended by the Assistant District Attorney that the rate fixed by the labor unions of $3.50 per day was the prevailing rate, but the court declared that the test of the prevailing rate was that actually prevailing by custom in the trade, and the rate being shown to be $3 per day, the case was dismissed and the acquittal of Taber promptly directed.

The impossibility of regulating the rate and hours of labor by legislation unless in the exercise of the police power or law of public health and safety, was recognized years ago by Chief Justice Ruger in McCarthy vs. Mayor, who said in reference to the original Eight Hour law then under discussion:

"It is well to premise that this act was not intended to affect or regulate the rate of wages, which should govern as between employer and employee. That subject is left by the Act, as it always must remain, open to be fixed by the agreement of the parties intending to enter into those relations. Experience has shown that legislation on the subject must always be futile and ineffectual, for the reason that it is controlled by the natural laws determining the value of labor and property, and which are as much beyond the power of statutes to affect as they are above the control of the wishes of the parties interested therein."

The decision of Justice White of the Superior Court at Buffalo, declaring the Eight Hour law unconstitutional is based upon the clause of the Constitution, which provides that no person "shall be deprived of life, liberty or property without due process of law." That provision of the Constitution has been construed to mean that the

rights and privileges of a citizen to make contracts relating to his business or property cannot be interfered with by legislation. It has been declared by the courts, that liberty, in its broad sense, as understood in this country, means the right not only of freedom from actual imprisonment, but the right of one to use his faculties in all lawful ways, to live and work where he will, to earn his livelihood in any lawful calling and to pursue any lawful trade or vocation. All laws, therefore, which impair or trammel these rights, which limit one in his choice of a trade or profession, or confine him to work or live in a specified locality, or exclude him from his own house, or restrain his otherwise lawful movements, except where the public health or safety intervenes, are infringements upon his fundamental rights of liberty, which are under constitutional protection.

The Man Who Harnessed Niagara.

There appeared in *Blackwood's* for September an article called "Harnessing Niagara," which will perhaps escape the attention of many engineers who ought to read it. It is by Professor George Forbes, Electrical Engineer, who was the chief designer for the company. No extracts can do justice to the article, and no description of the paper can reproduce its flavor. The generosity of the writer may be judged by the fact that no other engineer than himself is mentioned except Lord Kelvin, and Lord Kelvin is mentioned only to show how wrong that distinguished gentleman was. The taste of the article may be judged by the fact that the Americans are described as a people without humor, or invention or imagination, without repose, and abounding in brag, bluff and bounce, and that Professor Forbes found congenial society only at Tuxedo and among Transatlantic captains. Moreover, he takes the amazing liberty of naming in print a dozen rich and fashionable families who entertained him. The modesty of the article may be judged by the frequency of the use of the personal pronoun in the first person singular, of which we find there are 435 cases in an article of about 9,000 words. This is subject to some correction, however, as we only counted the pronouns on one page, and arrived at the total by multiplying by the number of pages. Furthermore, the reader is sedulously taught that but for Professor Forbes the whole enterprise would have been wrecked between the ignorance of engineers and the corruptness of manufacturers. We venture to give a few extracts which will give a faint notion of the charms of this article.

"There are two great mistakes commonly made as to Americans; one is that they are original inventors, the other is that they are humorous. Neither of these propositions is true. Invention and humor require a gift of imagination, the same gift that shows itself in poetry, in letters, in music, painting and sculpture, and in no one of these directions has this gift of imagination been found to predominate among Americans. I have given these reasons why it was perhaps natural to have recourse to a European to take hold of this great and entirely novel problem," which strikes us as particularly good, coming from an un-trepanned Scotchman. "The designing of a suitable dynamo was only one of a number of difficulties that had to be overcome. Some of these were of an engineering character, but others savored of politics, as that word is used in the States where it means intriguing, underhand dealing and jobbery. Until I went to America the manufacturers of electrical machinery never had a consulting engineer to reckon on. When they knew that I was to advise the Niagara Company they tried by every means in their power to revert to the old plan. Every game of bluff, bounce and threat was used, but without the least effect. This and other intrigues hindered me a good deal in carrying out my plans. Then again I had at times great difficulty in keeping the President and Vice-Presidents in hand. One of them believed himself capable of instructing me as to what tenders I ought to recommend, and did his best to try to influence my judgment. Most of them began to think they knew something about the subject, and that they were quite capable of settling what tests the machines should be put to. All this was generally amusing enough, but became almost tragic at times when I found them endangering the whole work. On such occasions I would write to my millionaires and tell them that if they did not do what I told them they would be personally answerable to the directors and shareholders for any disaster that might occur. This always had the desired effect and my point was carried."

One shudders to think what a narrow escape this great enterprise had. Supposing someone else had been called in. We suppose that one secret of Mr. Forbes' success is to be found in the following sentence: "An Englishman in America should always try to retain his Englishness; otherwise, in a year or two he will be reduced to the level of an average American." Horrible fate! Still success crowned his resolute Englishness, and he says "the whole work for which I was responsible has been put in place and set agoing without a single hitch. This is not usual in a novel work of so great magnitude. I feel confidence in asserting that so long as the instructions I insisted on are acted on there will be no trouble with the electrical machinery," and now we know who will be responsible if anything goes wrong. But with all its pecularities of taste the article is very entertaining (partly perhaps because of them), and it tells a great deal that is really interesting about the electrical work done in this great enterprise.

Annual Reports.

New York Central & Hudson River.—The full annual report of this company for the year ending June 30, 1895, was issued last week. The average miles operated were 2,399.48. The year before the mileage was slightly greater, namely 2,396.45. The main results of operation are shown in the following table:

	1895.	1894.	Inc or dec.	
Gross earn.	$42,489,537	$43,678,201	D.	$1,888,664
Oper. exp.	28,810,443	29,508,406	D.	697,963
Exp. to earn.	67.81%	67.57%		
Net earn.	$13,679,094	$14,169,794	D.	$490,701
First charges.	10,556,680	10,367,309	I.	189,371
Profit.	$3,122,414	3,802,486	D.	$680,072
Dividend.	4,339,991 (4½%)	4,588,826 (5%)	D.	248,836
Deficit.	$1,217,577	$786,340	I.	$431,236

It will be observed that the decrease in gross earnings was $1,889,000 and in operating expenses about $700,000. The year before, gross earnings fell off 3¼ million dollars and operating expenses 2¾ millions. That is, the decreases in the year now reported on followed very much heavier decreases in the preceding year. The net earnings fell off this year $490,700. Last year they fell off $475,622. In the main items of revenue the results were as below:

Freight earnings.	$24,268,719	$24,104,509	Inc.	$164,200
Passenger earnings.	12,975,112	14,151,278	Dec.	1,186,167

In all of the other items of revenue there were decreases in 1895, but those items are not of great magnitude.

In operating expenses the item of maintenance of way and structures, which amounts this year to about 4⅛ millions, and the item of maintenance of equipment, which amounts to about 4¼ millions, both increased very slightly. For all practical purposes they remain stationary. Traffic expenses amounting to over 17½ millions fell off $682,000.

The freight carried increased in tons and ton-miles. The tons of revenue freight for 1895 were 19,741,495, an increase of over 1,000,000 tons over 1894. The revenue ton-miles were 3,329,206,079, an increase of about 53,000,000 ton-miles. Thus, gross freight earnings showed an increase in spite of a fall in the average rate; that is, the average earnings per ton-mile in 1895 were 0.73 cents, and in 1894, 0.74. Per train-mile the freight earnings were slightly greater than in the preceding years: that is, $1.84 against $1.83. The average train-load was 252 tons in 1895 and 249 in 1894. So, in spite of a lower rate, the company can figure out an increased profit per ton-mile of $\frac{1}{10}$ mlil. That is, the profit per ton-mile in 1895 was 0.18 cents, and in 1894, 0.17 cents.

The heavy loss was in the passenger earnings, and this in spite of a greater number of passengers carried than in the year before. The total number of passengers in 1895 was 23,809,465; in 1894 it was 23,602,243. The way passengers were 273,000 more in 1895 and the through passengers 65,000 fewer. The fare per passenger per mile was also slightly less—namely, $1.89 in 1895 and $1.90 in 1894. Nevertheless, the passenger miles decreased from 742,542,163 to 686,589,144, a falling off of about 56,000,000 passenger miles, accounting for the decrease in gross receipts. The passenger train miles could not be reduced proportionately to the loss of business; the reduction was from 14,375,000 to 14,031,000, and the number of passengers per train-mile fell from 52 in 1894 to 49 in 1895. Therefore the profit per passenger per mile declined from 0.44 cent. to 0.35, and the passenger earnings per train-mile fell from $1.18 to $1.12.

The decrease in freight was nearly all in flour and grain and in lumber, viz., 400,000 tons in flour and grain and 149,000 in lumber. The great gains were in coal and coke, 712,000 tons; in merchandise, 270,000; in iron, steel and ore, 170,000, and in agricultural products (other than flour and grain), 155,000 tons.

When we come to look at the returns for the various quarter-years we find that the showing is actually encouraging, for all of the loss occured in the first six months of the year ending June 30, 1895, and the last two quarterly returns show decided gains. Besides this the statement of the earnings for the first quarter of the current fiscal year, which is just published, indicates a large increase. For the separate quarters, we have: in the first $1,371,025 loss; in the second $509,683 loss: in the third $112,964 gain; in the fourth $579,081 gain; and for the three months ending September 30, an estimated gain of $710,000.

Illinois Central.—The annual report of the Illinois Central railroad for the year ending June 30, 1895, makes a very encouraging showing, and that too in the face of a great many unfavorable conditions. It will be recalled that this period opened in the midst of long-continued depression, and to this was added the great Debs strike which had its very storm center in the territory of this railroad; and then followed immediately the almost universal failure of the corn crop in Illinois, Iowa and the other Western States. In a comparison of earnings with those of the previous year one must remember also that we are comparing them with the receipts from the immense World's Fair traffic. From this point of view the income of the road for the year is remarkable.

The gross earnings were $19,056,994, as against $20,657,463 for 1893-94, a loss of $1,600,469. But passenger earnings fell off $2,208,255, or 36.4 per cent., while freight earnings show an increase of $567,598 or over 4½ per cent., and this in spite of the fact that the average rate per ton mile has declined perceptibly. This shows two things clearly enough; that the traffic department is well managed, and that the freight carried by the road comes from a very large territory (the system includes now 2,888 miles of track), and is not confined to a few classes of articles.

The expense account shows pretty sharp contraction. Operating expenses amounted to $12,294,612, against $13,294,656; a reduction of $1,000,044, or 7½ per cent. In spite of this, more money was spent this year on maintenance of way and structures than before, the same being $2,538,678, against $2,469,853 for '93-'94. Considerable reduction was possible in the expenses for maintenance of equipment and for passenger train service, as well as in the item of claims and damages, which amounted to a saving altogether of nearly $850,000.

A comparison of the figures representing the sums spent on maintenance of way for the last five years shows that the hard times have not prevented the road from keeping up its standard of efficiency. During the last four of these years the miles of road have remained constant, and in 1890-91 they were but 13 miles less.

'90-'91.	'91-'92.	'92-'93.	'93-'94.	'94-'95.
$2,472,535	$2,793,512	$2,462,316	$2,192,329	$2 290,996

The reductions in the expense account have enabled the road to show only a small loss in net earnings, and we have $5,788,463, against $6,288,047 for '93-'94, a loss of $499,584, or 8 per cent.

Out of these net earnings all the fixed charges for the year have been satisfied in full, and a sum of $820,185 has been carried over into the surplus dividend fund. The road holds certain investments and controls a few subsidary lines which produce a considerable income, so that the amount available to meet fixed charges is larger than the sum given as net earnings above. We give a summary of the balance sheet, showing how the net income has been applied:

Net earnings	$5.788,464	
Income from investments and miscellaneous profits	1,642,442	
Surplus dividend fund	817,.68	
Available for fixed charges		$7,248,174
From this have been paid:		
Interest on funded debt	$2 867,815	
Rentals of leased lines	2,1.0,145	
Total	$4.927.989	
5% dividend on capital stock	2,500.0 0	
Total		7,427 989
Leaving surplus carried to dividend fund		$820,185

This condensed balance sheet shows that the company has more than earned its regular 5 per cent. dividend, a result which challenges comparison. The company is now about to increase its stock from $50,000,000 to $60,000,000, and has during the past year undertaken several financial transactions of considerable magnitude. A loan of $7,000,000 was made to supply funds for the purchase of practically the entire first mortgage of the Chesapeake, Ohio & Southwestern Railroad, whose junior securities had been previously bought in by the Illinois Central. The loan was negotiated on the very low basis of 3¾ per cent., and will be taken up by part of the additional stock to be soon issued. The Chesapeake, Ohio & Southwestern was sold to the Louisville & Nashville Railroad, but the contract of sale was annulled nearly a year ago, and the Court of Appeals of Kentucky has finally decided adversely to the power of the Louisville & Nashville to purchase, and this transaction is closed, leaving the C. O. & S. W. first mortgage in the hands of the Illinois Central. Another transaction of importance, completed this year, has been the refunding of the 7 per cent mortgage of the so-called Western (Iowa) lines in the new 4 per cent. bonds of the Illinois Central Western lines.

August Accidents.

Our record of train accidents in August, given in this number, includes 53 collisions, 71 derailments and 8 other accidents, a total of 132 accidents, in which 49 persons were killed and 140 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident, as reported, make it of special interest.

These accidents are classified as follows:

Collisions:	Rear.	Butting.	Crossing and other.	Total.
Trains breaking in two	9	0	0	9
Misplaced switch	5	1	2	8
Failure to give or observe signal	1	1	0	2
Mistake in giving or understanding orders	0	1	0	1
Miscellaneous	5	0	7	12
Unexplained	8	3	10	21
Total	28	6	19	53

Derailments.			
Broken rail	1	Track repairers	1
Defective bridge	1	Derailing switch	2
Defective switch	2	Animals on track	2
Soft road bed	1	Landslide	6
Broken axle	3	Washout	2
Defective brake	1	Malicious obstruction	3
Fallen brakebeam	3	Accidental obstruction	2
Failure of drawbar	1	Unexplained	33
Misplaced switch	7		
			71

Other Accidents.	
Boiler explosion	1
Various breakages of rolling stock	1
Other causes	6
	8
Total number of accidents	132

A general classification shows:

	Collisions.	Derailments.	Other accid's.	Tot'l.	p.c.
Defects of road	0	5	0	5	4
Defects of equipment	9	8	2	19	14
Negligence in operating	23	10	1	34	26
Unforeseen obstructions	0	15	5	20	15
Unexplained	21	33	0	54	41
Total	53	71	8	132	100

The number of trains involved is as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Passenger	17	25	6	48
Freight and other	76	47	2	125
Total	93	72	8	173

The casualties may be divided as follows:

Killed.	Collisions.	Derailments.	Other accid's.	Total.
Employees	11	18	1	30
Passengers	3	5	0	8
Others	7	4	0	11
Total	21	27	1	49
Injured.				
Employees	16	23	2	41
Passengers	38	36	4	78
Others	12	9	0	21
Total	66	68	6	140

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. Killed.	Pass. Injured.	Emp. Killed.	Emp. Injured.
Defects of road	1	0	2	7
Defects of equipment	0	0	2	3
Negligence in operating	3	52	14	26
Unforeseen obstructions and maliciousness	2	14	4	3
Unexplained	2	12	8	2
Total	8	78	30	41

Thirty-four accidents caused the death of one or more persons each, and 21 caused injury but not death, leaving 77 (58 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with August of the previous five years shows:

	1895.	1894.	1893.	1892.	1891.	1890.
Collisions	53	25	50	94	111	85
Derailments	71	89	90	119	110	82
Other accidents	8	9	7	8	2	11
Total accidents	132	150	147	221	223	178
Employees killed	30	25	28	35	36	65
Others killed	19	25	38	15	55	35
Employees injured	41	94	67	104	152	196
Others injured	99	42	95	109	189	96
Passenger trains involved	48	44	55	68	92	66
Average per day:						
Accidents	4 26	4.84	4.74	7.13	7.19	4.74
Killed	1.58	1.61	2.13	1.61	2.94	3.23
Injured	4.52	4.39	4.94	8 69	11.00	9.42
Average per accident:						
Killed	0.371	0.333	0.449	0.226	0.408	0.562
Injured	1.060	0.907	1.041	0.964	1.529	1.640

The number of passengers killed or fatally injured is larger than we have had occasion to report for a year. Only once since January, 1894, have we noted as many as eight passengers killed in a single month, and that was in August, 1894. The worst passenger train accident in the present record, that at Liberty Park, N. J., on the 15th, was reported in the *Railroad Gazette* of Aug. 30. The other five accidents killing passengers were in widely separated parts of the country. Two of the passengers killed were riding in a freight train. The wreck at Fisher, Col., on the 27th, killing one passenger, was caused by a rock weighing over 100 tons which fell upon the train from a great height. Had the rock fallen a second later it would have crushed a sleeping car, full of passengers. There were two other cases in August where passenger trains were struck by rocks falling from great heights, and another startling accident of this kind has already occurred in September.

The very bad accident at Bainbridge, O., on the 11th, is classified as unexplained, no accurate information having been obtained.

Near Bellefontaine, O., on the 5th, 25 soldiers in an excursion train were injured by wadding and powder from a cannon in a curious manner. On another excursion train, carrying Knights of Pythias and running in the opposite direction, a cannon in the baggage car was being fired at frequent intervals for the entertainment of the excursionists, and a heavy dischage was made just as the trains met. Several persons were made blind or deaf.

Three persons were killed and 30 or more injured in electric street car accidents in August. At Indianapolis there was a collision, due to a misplaced switch; near Norfolk, Va., a train of three electric cars, carrying 200 passengers, fell down a bank, and two persons were crushed to death beneath the cars. Near Lancaster, Pa., there was a butting collision, due to an attempt to run a car beyond its regular meeting point; near Hartford, Conn., there was a rear collision on a bridge in the night, in consequence of the foremost car being darkened by the slipping off of the trolley; near Philadelphia a half dozen or more were injured by jumping off from a runaway car, which, however, was stopped without derailment. In this case an excursion was run over a track which had been little used, and which was, therefore, made slippery by the weeds which were crushed by the wheels. At Allegheny, Pa., on the 22d, a trolley car was wrecked by the locomotive of a freight train at a crossing, and there was a similar accident near Chester, Pa.

Mr. F. J. S. Hopwood, the Railroad Secretary of the British Board of Trade, has issued the usual "general report" on railroad accidents in Great Britain and Ireland for the year 1894, supplementing the regular statistical report, which showed only 16 passengers killed and 347 injured by train accidents. The present document contains a page of general remarks, and summarizes the facts and lessons of those accidents which have been inquired into by the inspecting officers of the Board. Thirty-five accidents were thus investigated in 1894. Only four accidents caused fatal injuries to passengers and only two, besides these four, were attended with fatal results to employees. Seven persons were killed and 9 injured while riding in a wagon across a private level grade crossing on the South Eastern Railway, near Chartham, Oct. 9. But for the disaster at Chelford, killing 14 passengers, the death record would have been very low. As it was the total number of passengers killed in train accidents, 16, was only one in about 57 millions carried, season ticket passengers not being counted. The total number of employees killed (all causes) was 479, and injured 2,711. The number killed in switching operations, including coupling and uncoupling, was 136. The number of brakemen and goods guards killed (by all causes) was 45, or one in every 223 employed. One in 21 of this class was injured. In the United States, for the last year reported by the Interstate Commerce Commission (1893), one trainman in every 115 was killed and one in every 10 was injured.

Chairman Midgley, of the Western Freight Association, has issued a circular letter to the members of the association in which he uses some very direct language in regard to the recent action of the roads in reducing coal and lumber rates. He reiterates his declaration that all of the reduced tariffs now in effect are in direct violation of the rules of the association, and that they must be withdrawn not later than Oct. 11. Continuing, he says: "The machinery of the Western Freight Association is ample to insure the strict maintenance of the established rates, if the members thereof will faithfully regard their obligations. All that is requested is that the managers shall instruct their subordinates to keep well within the required restraints, and, further, give them plainly to understand that no deviation from the established rules and rates will be tolerated. It is worse than idle for the highest officers to shirk the responsibility. An illustration in point is supplied by Eastern lines. The presidents met some weeks since, and, finding that conditions were worse than had been anticipated, they inaugurated an improvement in both east and west bound traffic. The better state of things depending, as it does, upon the word of the executive officers, can be duplicated in the West whenever the officers of corresponding rank take enough interest in the matter to resolutely effect the desired change."

The Atchison, Topeka & Santa Fe evidently intends that the Sunset Limited train of the Southern Pacific from New Orleans to San Francisco, which had such a successful career last winter, shall not have all of the glory (and passengers) this winter, and has announced hat, beginning October 29, it will run a new westbound imited express from Chicago to Los Angeles and San Diego, leaving Chicago at 6 p. m., making the run to Los Angeles in three days. It will arrive at Los Angeles at 6.30 p. m. of the third day and at San Diego at 10.30 p. m. The train will have the latest Pullman cars and a through dining car will be run from Chicago, serving breakfast and lunch a la carte and a table d'hote dinner. On at least one day in each week a compartment sleeper will be run. A chair car will be run to accommodate local travel between such points as the train is scheduled to stop at. Eastbound the same train will be run, but not quite so fast as westbound. Only first-class passengers will be carried on this train, second-class travel being accommodated by the present service, which is not to be diminished. This announcement seems to contemplate a train every day in the week. The Sunset Limited ran once a week last season and is advertised to run twice a week this.

Since our last issue there has been a further advancement in coal prices. The advance has been from 25 to 35 cents a ton on domestic sizes in the tidewater market and some 50 cents a ton in the Buffalo and upper lake markets. The present tidewater circular is, broken $3.00, egg $3.40, stove $3.50, and chestnut $3.15, all f. o. b. tidewater, net. This circular is used by all companies except the Lackawanna, which asks $3.60 for stove and $3.40 for chestnut. The advance was brought about under lead of the Lackawanna, which company made the announcement that it again proposes to put up its prices For the first time in several years the new circular is being adherred to on new business, while hold-over orders are generally being cancelled, and there is some talk of still further advances. The advance at Buffalo was to $4 per gross ton for broken coal and $4.25 for domestic sizes. At Chicago and other lake ports the advance has been equally as great. One of the strongest features of the situation is the universality of the advance.

On another page of this issue will be found a statemen of the votes cast in the letter ballot of the Western Society of Engineers on the question of withdrawing from the Association of Engineering Societies, and unfortunately the resolution to withdraw was carried by a considerable majority. We say unfortunately, for we have little doubt that this action is a mistake not for the Association alone, but for the Western Society. But it is too late now for speculation on the subject, and we shall have to wait for time to determine whether the results are good or bad. That ambitious society can now proceed to work out the full measure of its great aspirations, and its identity will not longer be merged in an association. The theory of those who have been active in bringing about the withdrawal is that the society acting individually can publish its transactions cheaper, more promptly, and altogether more satisfactorily to the members than they have been published in the *Journal of the Association*. A year of actual trial will test the correctness of this theory.

NEW PUBLICATIONS.

Central Station Bookkeeping and Suggested Forms. With an appendix for street railways. By Horatio A. Foster. New York: The W. J. Johnston Co., 253 Broadway.

Presupposing a thorough knowledge of double entry bookkeeping, the author has compiled and elucidated a classification of accounts and a complete set of forms for reports on all the details entering into the management of electric central stations, giving incidentally insight into their organization. The suggested forms are derived from actual experience. They embody the results of long extended efforts of central station managers all over the country to trace every item of expense or revenue so as to enable them to play their station like an instrument. A careful study of this book will amply repay even managers who are already artists.

TRADE CATALOGUES.

Machine Tools.—The Gisholt Machine Co. of Madison, Wis., sends us a catalogue showing turret lathes, screw machines, monitor gap and chucking lathes and tool grinders with parts and attachments. The catalogue is intended to give a general idea of the varieties and sizes of machines manuiactured by that house, photographs and detailed descriptions of which will be furnished on request. The company was organized for the purpose of building extra heavy and powerful turret machines, and it now manufactures a large number of varieties of turret lathes in sizes swinging from 13 to 15 in. The universal tool grinding machine is a new product, and is the outgrowth of the needs of the company's shops.

TECHNICAL.

Manufacturing and Business.

Bryan & McKibbin, 120 Broadway, New York City during the past week have received the general Eastern agencies for the Buckeye Malleable Iron and Coupler Co., makers of the "Little Giant" car coupler, Columbus, O., and of the Oriel Lumber Co., St. Louis. They are also Eastern agents for Phillips, Nimick & Co., Ltd. (Sligo Rolling Mills), Pittsburgh, and the A. Leschen & Sons Rope Co., manufacturers of steel and iron wire ropes, St. Louis The copartnership of Bryan & McKibbin was organized only two months ago to deal in railroad and contractors' supplies, and has met with much success. Both members of the firm are well known as former railroad officers.

The Buffalo Forge Co. is now supplying several carloads of machinery, consisting of fans, engines and heaters, for the heating and ventilation of the new shops of the Southern Railway Co. at Knoxville, Tenn., now being erected. All of the buildings will be equipped with the Buffalo fan system. The apparatus consists of six fans, three 130-in., two 140-in. and one 80-in. in size, which have a total combined capacity of delivering 496,960 cu. ft. of air per minute at 1 oz. pressure. The large fans are in the main equipped with double direct-connected engines entirely enclosed to keep the dust from the working parts. The Buffalo Forge Co. has also received contracts for heating the Southern Railway shops at Atlanta.

The Railroad Supply Co., whose offices are in the Owings Building, Chicago, has recently made large sales of the well-known National surface cattle guards, a number of the orders being for carload lots. Among the companies which have recently ordered these cattle guards are the Louisville & Nashville, the Union Pacific, the Missouri Pacific, the Columbus, Hocking Valley & Toledo, the Lake Erie & Western, and the Detroit Lansing & Northern.

Curran & Hussey, engineers and contractors of bridges and iron structures have the contract for erecting a number of buildings for the Apollo Iron and Steel Co., of Apollo, Pa. These buildings include a boiler house 47 ft. × 260 ft., an open hearth building 53 ft. × 1,120 ft., and an annealing house 80 ft. × 200 ft. and 34 ft. high. The open hearth building is 34 ft. high in one part and 40 ft. high in another. On the outside of this building two sheds are to be built, one 400 ft. long and the second 350 ft. long.

The International Car Co., has recently filed a charter in Maine authorizing it to build and operate a drawing room, sleeping and other passenger cars. Of the capital stock of $500,000, only $3,000 is reported as paid in. John L. Bixby, Jr., is President, and George C. Tewksbury is Treasurer, both being residents of Arlington Heights, Mass.

The Altoona Foundry and Machine Works are now running 10 hours a day, and within the next week it is expected to operate the works at night in order to keep up with the orders.

Incorporation papers have been taken out for the Chicago Pressed Steel Company, capital stock $500,000, for the manufacture of steel railroad ties. James W. Wilson, John M. Hoon and Edward L. Lamb are the incorporators. The plant will be located at Chicago Heights, and will have a capacity of 250 tons daily. The mill will be 320 feet long by 75 feet wide.

The Acme Coupler Co., of St. Louis, has been organized by J. G. Chouteau, J. B. Dockery and Louis Hinsman.

The Chicago Pneumatic Tool Co., 1553 Monadnock Block, Chicago, has just received an order from England

for 8 pneumatic hammers. This order was placed after a trial of two months. The company has also closed a contract with a firm in London for 120 hammers a year, to be delivered at the rate of 10 each month; 7 hammers have also been shipped to Montreal for railroad work.

The firm of Fisher & Porter, of Chicago, dissolved Oct. 1. Mr. Albert Fisher, of the firm, will retain the present office, 1025 Monadnock Building, and will represent Wm. Tod & Co., of Youngstown, O., builders of the Williams vertical high grade engines, especially adapted for electric railroad and lighting service, and the Porter-Hamilton engines, especially adapted for heavy duty in manufacturing establishments, rolling mills, etc. The firm also makes blowing engines, hydraulic cranes and accumulators and heavy special machinery.

J. R. Ellicott, of the General Agency Co., of New York, has opened a branch office at No. 1435 Old Colony Building, Chicago. Mr. George H. Lowerre will be in charge.

The American Brake Beam Co., of Chicago, which recently bought the plant of the American Nut Lock Co., of St. Louis, has removed all of the machinery, etc., of that concern to its works at Waukegan, Ill., and will be ready to manufacture the nut locks upon a large scale in about two weeks.

The Smith triple expansion exhaust pipe was specified on 30 Lake Shore & Michigan Southern engines, and 30 Illinois Central engines, recently ordered.

The Whiteley Malleable Casting Co., of Muncie, Ind., is doing a large business in the manufacture of car couplers, and has orders on hand for upwards of 15,000. They are being turned out at the rate of 200 couplers a day.

Iron and Steel.

It is reported that President Wood, of the Maryland Steel Co., announced recently that all the blast furnaces at Sparrow's Point would resume work within the next two weeks and that it was expected to have the entire works in operation in the near future.

It is said that C. M. Reed, of Erie, Pa., and a number of other local capitalists, have let a contract for the building at Erie of a large iron foundry.

A meeting was held at Austin on Sept. 23 of foundrymen of Texas to organize an association, and also to ascertain rates from Birmingham to Texas points on pig iron and coke. The following were present: Arlington Ironworks, Austin, L. P. Clark; Collins Manufacturing Company, San Antonio, J. E. Austin; Fort Worth Ironworks, J. F. Moore; Fuller Engineering Company, Calvert, J. T. Fuller; Tyler Foundry, J. F. Christian; Hartwell Ironworks, Houston, C. P. Wiggin; Austin Foundry and Machine Shops, Houston, B. F. Heirman; Washington Ironworks, Sherman, and Mosher Manufacturing Company, Dallas, W. S. Mosher. The association submitted to the railroad men a request for a rate of about $5 a ton on coke from Pennsylvania points and asked, also, reduced rates on pig iron. Argument was made that a high rate on pig iron forces them to use a great deal of scrap iron, and that, if a lower rate was given, it would increase the volume of railroad iron shipments and at the same time increase their own business. The traffic men took the request under consideration.

Press reports state that the Howard Harrison Iron Company, of Bessemer, Ala., has been awarded a contract by the city authorities of the city of Honolulu, for furnishing them with 30,000 tons of iron pipe, for the water supply system of that city. This is the second large foreign order that has gone to Alabama recently, the Anniston Pipe Works having received an order for 5,000 tons of pipe for the city of Tokio, Japan, within the past two months.

It is reported that the large plant of the West Superior (Wis.) Iron Works is being made ready to open. It is now in the receivers' hands, and an action to foreclose a trust deed in favor of the Central Trust Company, of New York, is to be argued at the present sitting of the Wisconsin Supreme Court.

New Stations and Shops.

The Board of Trade of Brazil, Ind., has offered the Chicago & South Western a subsidy of $20,000 if the shops of the company are erected at Brazil.

The new machine shop for the Granger Foundry & Machine Co., at Providence, R. I., is designed and built by the Berlin Iron Bridge Co., and is 110 ft. wide and 306 ft. long. The construction is similar to the Fuller Iron Works machine shop, designed by the same company, and which has been illustrated in these columns.

New Brooklyn Bridge Terminal Opened.

The new Brooklyn terminal of the New York and Brooklyn Bridge was opened to the public on Sunday, Sept. 29. The change in the movement of trains was made without trouble. The new structure, which was started about two years ago, was made necessary by the impossibility of properly handling the large crowds using the bridge cars with the existing means. The new station provides about double as much room for loading and unloading passengers, and will make it possible to fill and empty the cars much more rapidly than heretofore. The Brooklyn Elevated road had built its connections with the bridge, so that when the new bridge terminal was opened no trouble was experienced by that road. The necessary changes in the Kings' County road were also about finished at the time of the opening of the bridge terminal. The Brooklyn Elevated road has issued a notice to its patrons, informing them that to avoid overcrowding of trains at rush hours, pending the completion of improvements now being made, five-car trains will be run instead of four, as heretofore.

The new terminal extends from High to Sands streets and is about 300 ft. long. The provision for the selling of tickets is far better than in the old station, there being a great many more ticket windows, 10 ticket sellers being on duty during the hours of greatest travel. There are eight entrances to the building on Washington street, eight on the Fulton street side, and two large entrances on Sands street. There are two double stairways leading to the second floor from the ground. The terminal will be lighted throughout with electricity. The waiting rooms for men and women are at the southerly end on the ground floor. The time of filling a train, as observed on the day of the opening of the terminal, was 10 seconds. With the new terminal it will be possible to run trains under 45 seconds' headway if desired; but this will not be done until the work of remodeling the New York terminal has been completed, which will be some time next spring.

Street Railroad Postal Cars.

The first regular trip of the new postal cars recently introduced on the Third Avenue line, New York, was made on Oct. 1. A trial trip was made on Saturday night, Sept. 28, at which members of the press and a number of officials of the railway mail service were present. The trip was made with three cars, each drawn by a grip car. These cars will make half-hourly trips from 5 a. m. until 8:30 p. m. between the General Post Office (at Broadway and Park Row) and 194th street, via Third Avenue, 125th street and Amsterdam Avenue, about 12 miles. There will also be one or two night trips. Thirteen branch offices are served by these cars. The cars are 22 ft. long. The interior of each car, which at night is lighted by Pintsch gas, is fitted up with distributing pigeon holes, assorting tables and racks for mail pouches. The outsides of the cars are painted white with gilt trimmings.

A second street railroad mail route was established in Philadelphia Oct. 1. The first line, established some months ago, runs to Chestnut Hill and the new one runs to stations A, J, C, Z (Falls of Schuylkill) and Manayunk. There are two 25 ft. cars on this route, in each of which the Post Office occupies about one-half, the other half being used by passengers.

Boston Subway Bids—Section 3.

Sealed bids for building section 3 of the subway (the Park street station), in accordance with the form of contract and specifications to be furnished by the Boston Transit Commission, will be received at its office, 20 Beacon street, Boston, Mass., until 12 o'clock m. of Thursday, Oct. 17, 1895. The location of this section is on Boston Common, at the corner of Park and Tremont streets. Some other particulars are estimated to be as follows: 51,000 cu. yds. of earth excavation; 43,000 cu. yds. of surplus earth to be removed; 1,250 tons of iron and steel, furnished by the Commission, to be set in place; 8,500 cu. yds. of concrete, brick and stone masonry. Plans can be seen and specifications and forms of contract can be obtained at the above office. The Commission reserves the right to reject any and all bids.

The Panama Canal.

The *Star and Herald* says that matters pertaining to the canal are looking brighter week by week. The number of men is being continually increased, and every week one sees the work extending. A good deal of work is doing at Culebra and Cucharacha, along the line, and at La Boca, the Panama end of the canal. At present ten locomotives and 500 cars are taking away the excavated material, and two dredges are deepening the channel leading to La Boca, where 400 men are at work.

Automatic Signals on the Metropolitan Elevated.

The Metropolitan West Side Elevated Railroad, of Chicago, has contracted with the Rowell-Potter Safety Stop Company to equip its road with Rowell-Potter signals. These signals, which automatically apply the brakes on a train that overruns them, were described in the *Railroad Gazette* of Oct 6 and Dec. 22, 1893.

Contracts for Three Sea-Going Torpedo Boats.

The contract for building two sea-going torpedo boats has just been awarded by Secretary Herbert to the Hereshoffs, of Bristol, R. I., the contract price being $144,000 each. The bill passed by Congress authorized the construction of three such boats, one to be built on the Atlantic Coast, one on the Pacific Coast and one on the Mississippi River. As no bids were received from any ship builders on the Mississippi, the contract for two of the boats were awarded as stated. The contract for the third boat has been awarded to a firm in Seattle, Wash., at a contract price of $160,000.

THE SCRAP HEAP.

Notes.

At Colorado Springs, Sept. 21, two train robbers were sentenced to 10 years' imprisonment each and a third to eight years.

From an item in the St. Louis *Republic* it appears that the Union Station Hotel at St. Louis is now managed by the Missouri, Kansas & Texas Railway, the lease having been bought by that company from the Union News Company, of St. Louis.

A reporter in Topeka, Kan., learns from General Manager Frey, of the Atchison, that a large number of forged testimonials have been secured by railroad men at Columbus, O. These letters seem to have emanated from some one person. Most of them are favorable statements of the service record of the bearer and appear to have been signed by a Master Mechanic of the Atchison, Topeka & Santa Fe.

Two ex-strikers were arrested in California last week on suspicion that they intended to destroy the monument erected over the graves of the soldiers who were killed in a train wreck during the strike of 1894. This monument, erected by order of General Graham, bears the inscription, "Murdered by Strikers," and the ex-strikers have made persistent efforts to have the inscription removed. The monument is now guarded night and day.

The South Carolina Constitutional Convention now has before it an article, of 19 sections, on the subject of corporations, a committee having reported it on Sept. 27. Among the provisions are one requiring the legislature to provide for the election of officers of corporations by cumulative voting, and one prohibiting corporations from engaging in any business not specifically authorized in their charters. The State Railroad Commission is continued.

At the annual meeting of the Illinois State Liquor Dealers' Protective Association, held in Bloomington, Sept. 24, the Chicago & Alton Railroad Company came in for a share of attention. It appears that the rule of this company, forbidding employees to drink intoxicating liquor, was the cause, some time ago, of a decision of the Association requiring its members to refrain from sending freight over the Alton road; but, according to one of the speakers, that decision has not been well lived up to. It does not appear that this protest elicited applause, or even sympathy; and we are forced to the conclusion that the members at large are too selfish to take an interest in the woes of the Bloomington saloonkeeper.

Lake Notes.

The steel vessels to be built at the yards of the American Steel Barge Co., at Superior, Wis., noted last week, will be 380 ft. long, 45 ft. beam, and 26 ft. deep. They will rank with the largest carriers on the lakes, and will cost not far from $200,000 each.

Work has begun at the yards of the Union Drydock Co. at Buffalo on the construction of a steel freighter 315 ft. long, to carry about 400 tons of package freight, probably for the Union Transit Co., in which John Gordon, late manager of the Northern Steamship Co., is prominently interested.

F. W. Wheeler & Co. have launched a steel lumber carrier for Green Bay people 228 ft. long, 38 ft. beam, and depth 25 ft.

The steamer Yale has carried out of Chicago 120,000 bushels of wheat and 65,000 bushels of oats, a total of 5,200 tons. This is the largest cargo of grain ever carried on the lakes.

The strong probability that freights will be remunerative next year, at least, is encouraging vessel men to make additions to their fleets, and the fact that small carriers are no longer in the race as money-makers because of the deeper channels and the larger vessels possible, is causing many to discard their ore and grain vessels for larger ones, putting the discarded fleet into other lines of trade.

The Ireland Building Disaster.

On Sept. 27 the Grand Jury brought indictments for manslaughter in the second degree against the six persons whom they considered responsible for the collapse of the Ireland Building at West Broadway and West Third street, New York city, on Aug. 7, when 15 workmen were killed. These persons are C. E. Behrens, the architect, John H. Parker, the contractor, and four others.

Transferring Sleeping Car Tickets.

A suit against the Pullman Palace Car Company, tried at Baltimore last week, resulted in a verdict of 1 cent damages. Martin Curlander and his wife visited the World's Fair a year ago last October and were compelled to occupy upper berths in a Pullman sleeping car. Riding backward during the day rendered Mrs. Curlander ill. A sympathizing man, who had purchased a section through to Chicago, but left the train at some point east of there, gave his receipt for the section to Mr. Curlander with permission to occupy it, but the Pullman conductor had resold the section and forced Mr. and Mrs. Curlander to vacate. Mr. Curlander sued the Pullman Company for $10,000 damages, claiming that his wife was made ill by being forced to ride backward. In the trial Judge Ritchie decided that the purchaser of a seat or section in a Pullman car had a legal right to transfer it to whomsoever he pleased, and that Mr. Curlander was entitled to damages because of the conductor's action. But the jury, after a week's trial, seemed to think that the sufferings of the plaintiff were not great, for they returned a verdict for only one cent damages.

Traffic on the Kiel Canal.

A cable dispatch from Berlin says that complaints have been made by the Chambers of Commerce at Kiel and Stettin, as well as by others, concerning the tolls of the Baltic-North Sea Canal, but that the government has declined to reduce them. During the month of August only 718 vessels passed through the canal, and this at the old rates. On Oct. 1, the new tariff, which increases the tolls by 25 per cent, went into effect.

Moving a Factory Without Stopping the Machinery.

In the work of track elevation on the Providence division of the New York, New Haven & Hartford it became necessary to move one of the largest factory buildings of the Sturtevant Blower Works at Jamaica Plain. This building is 50 × 350 ft., about half the length of which has three and the other half two stories. The three-story portion was moved about 50 ft. east and 300 ft. south and the other portion was moved 50 ft. east from its former location. The work in the three-story section, except upon the lower floor, was carried on all of the time during the removal, power being supplied by a 20-H. P. electric motor belted from the second floor of the building to the main line of shafting. Provision was made for moving the motor away from the generator, which was situated in the engine room, by placing a reel containing the conducting wire upon the floor of the moving building, which allowed the wire to unwind and made it possible to keep the motor running while the building was upon the rollers. The moving was carried out in the usual way by means of capstans worked by horse-power, which were connected to the building by ropes and blocks. The building was thor-

oughly tied in both directions by heavy iron rods before the moving was commenced, and though the walls of the first story are 20 in. thick, and of the second story 16 in. thick, the work was done without injury to the structure, in spite of the fact that the latter part of the journey was over filled ground.—*The Boston Herald.*

Still Another New Record on the New York Central.

The fast run which was made on the New York Central Sept. 24, 65.96 miles an hour for 147.84 miles, was beaten the very next day, another special train carrying newspapers having run from Albany to Syracuse, 147.84 miles in 130 minutes, equal to 68.23 miles an hour. Nothing is said in the reports about the amount of time occupied in running through the street approaching Syracuse. The weight of the two cars of this train is given as 167,107 lbs.

Degenerate Train Robbers.

One of the discouraging aspects of modern progress is the progress *downward* that is often observable, even where the general current of affairs is hopeful. Clothes are better and cheaper than they used to be, but tailors are humiliated by machine methods that get ahead of them. Freight is carried for almost nothing, but how are the mighty conductors and brakemen of former times fallen! And now one of our most prominent new industries—train robbing—seems to be rapidly degenerating. Instead of the stories of dashing valor that were common even so lately as 1893 we now find this hero-developing profession figuring in the press despaches on a level with ordinary ruffianism and sneak-thievery. Witness these reports from two western towns, one of them a place of considerable size:

BUFFALO, N. D., Sept. 29.—The mixed train on the Northern Pacific was held up near here at 1 a. m., by six men, supposed to be tramps. Three passengers, John Freeson, Frank Richards and Charles Jenrak were robbed and severely beaten. The robbers secured $60 and made their escape. Three of the tramps boarded the train at Jamestown. While the train was going down a grade they entered the caboose where the passengers were and made an attack with revolvers and knives. As none of the trainmen was in the caboose the tramps had things all their own way. They forced the passengers out on the platform and then pounded them with their guns until they jumped off. The robbers are still at large.

CHICAGO, Sept. 29.—A bold robbery occurred in a Pullman sleeper on the Wabash Limited as the train was leaving the city for Detroit Thursday night. A well-dressed man entered the sleeper and stopping at the first occupied berth calmly climbed in, at the same time choking into silence Mrs. George Mack, the occupant. After securing the pocketbook, jewelry and clothes of the terrified woman, whose husband sat in the smoking compartment only a few feet away, the robber attempted to leave. Mrs. Mack clung to him, however, and he only escaped after knocking her senseless. He jumped from the moving train, and, apparently uninjured, escaped in the darkness.

A Costly Mistake.

The Great Western Railway, of England, has lately paid $500,000 to get released from the obligation to stop every train at Swindon for 10 minutes. In 1841, before the road had reached Bristol, it made an agreement for 99 years with a firm of builders to hold every train carrying passengers, "not being sent express or for special purposes, for a reasonable period of about 10 minutes," at Swindon, in consideration of the erection of suitable refreshment rooms, for which a rent of a penny a year was to be paid. The railroad soon found out the inconvenience of the arrangement and tried to break it. The courts in 1846 and in 1872 held that "express" did not mean in the contract what is now meant by an express train; but the price asked for the annulment of the concession was always more than the company was willing to pay. After a fight of over 50 years it has been driven by the competition of other roads to buy in the contract, and the 10-minute stop of fast expresses at Swindon is now a thing of the past. Swindon is about 75 miles from London.

Manchester Ship Canal.

A despatch from Manchester, dated Oct. 1, says: "In consequence of the action of certain shipping merchants, in offering to carry freights from New Orleans and Galveston to Manchester at the same rates as from those ports to Liverpool, the Manchester Cotton Association to-day decided to insist that all importations contracted for by members of the association after Oct. 1 shall be shipped direct by way of the Manchester Ship Canal."

Baldwin Locomotives for Russia.

The Baldwin Locomotive Works have a contract for building 40 locomotives for Russian railroads. All the engines are to be Vauclain compounds, 20 being for passenger service and the other 20 for freight service. This contract is from the Russian Government, and the locomotives are to be made at once. The freight locomotives included in the order are to be consolidation engines, weighing in working order about 60 gross tons each, and are to be built after the standard construction of the Baldwin Works. The passenger locomotives are 10-wheel engines, weighing about 60 tons each. They are of the same general dimensions and weight as the locomotive "Atlanta" now exhibited by the Baldwin Works at the Cotton States Exhibition at Atlanta. The passenger engines will have 6-wheel tenders.

CAR BUILDING.

The Mexican Central Railroad Co. is in the market for 60 coal cars.

The Baltimore & Lehigh has let a contract for building 300 cars.

The Wheeling & Lake Erie Coal Co. is in the market for 100 coal cars.

The Atlantic Coast line is reported to be in the market for the construction of 1,500 freight cars.

The Chicago, Milwaukee & St. Paul is to build 200 standard 34 ft. box cars at its shops in Milwaukee.

The Wheeling & Lake Erie, it is said, will be in the market for a number of new locomotives about December.

The Omaha & St. Louis Railroad has recently placed an order with the Michigan-Peninsular Car Co. for 500 box cars.

The Grand Trunk has recently ordered 500 box cars from the Pullman Palace Car Co., and 500 from the Michigan Peninsular Car Co.

The Pittsburgh, Shenango & Lake Erie has placed an order for building 500 cars. The Michigan Peninsular Car Co. is said to have the contract.

The Kansas City, Pittsburgh & Gulf has given the Barney & Smith Car Co. an order for 10 furniture cars. The company is now in the market for 200 box cars.

BRIDGE BUILDING.

Allison, Ia.—Bids are asked until Nov. 5, for building a number of wooden or pile bridges, under the direction of the board of supervisors of Butler County during one year.

Delaware, O.—Bids for building a steel bridge of 148 ft. span over the Olentangy River, between Delaware and Marion Counties, will be received until Oct. 10.

Erie, Kan.—Bids for constructing three highway bridges, having spans of 62, 77½ and 93 ft. respectively, have been received by the county commissioners. The contract was awarded to the Farnsworth & Blodget Co., of Kansas City, the lowest bidders, their bids being $888, $1,196, and $1,466 respectively.

Joliet, Ill.—The contract for a steel bridge over Hickory Creek at Second avenue has been awarded to the R. D. Wheaton Bridge Co., of Chicago, at $5,125. The bridge is to be completed by Dec. 14.

Marinette, Wis.—The contract for building the bridge over the Menominee River, to Menominee, Mich., has been awarded to W. D. Van Norman, of Minneapolis, at a cost of $4,800.

Middletown, O.—It has been decided to build a lift bridge over the canal at Main street, this place.

New York City.—We have received from Mr. Gustave Lindenthal, Chief Engineer of the North River Bridge Company, the following letter, which explains itself. We need only add that the confusion of the two companies was the outcome of carelessness and not of intent: "May I make a correction of a statement appearing in your last issue on page 645, relating to a decision recently made by Vice Chancellor Emery of the Chancery Court in Newark, which you report as having an important bearing on the construction of the New York & New Jersey Bridge? The above-mentioned decision has nothing to do with that bridge scheme, but was made in a case of the North River Bridge Company, growing out of construction work done in Hoboken. The New York & New Jersey Bridge Co. is not a federal corporation, but the North River Bridge Co. is. The North River Bridge Co. has had litigation, on account of the condemnation of property, to establish the validity of its charter and rights thereunder. The decisions of both the Federal and State courts unqualifiedly sustained the rights of the company. On the other hand, the New York & New Jersey Bridge Company has never commenced work in New Jersey, nor has it made any attempt to prove the validity of its state charters by litigation. I am rather inclined to think that if attempted it will consume several years more time than was the case with the litigation of the North River Bridge Company."

Phillipsburg, Kan.—Bids will be opened on Oct. 10 for the steel bridge over the Solomon River at Logan. Bidders are to submit bids for either two 70-ft., or one 120-ft. span, also for a steel bridge, 60 ft. long over Prairie Dog Creek at Long Island. Address I. D. Thornton, County Clerk.

Pittsburgh, Pa.—Mr. Bigelow, Director of Public Works, asks for bids for a 150 ft. span arch at the entrance to Schenley Park, the plans and specifications to be submitted with the bids. Among those approved is a stone arch designed by Mr. J. L. Silsbee, of Chicago, and a Melan arch with center joint by Mr. Fr. von Emperger, of New York.

The grand jury on Sept. 25 refused to affirm the report of a board of viewers in the matter of a petition for a bridge over Peters creek, near Gill Hall. The board of viewers had recommended the building of the bridge.

Ridgewood, N. J.—The following bids were received on Sept. 28 for a 40 ft. span Melan Bridge: B. Gordon Bailey (informal), $2,780; Melan Arch Constr. Co., New York, $2,250; I. H. Hathaway & Co., Philadelphia, Pa., $2,230; Woolfort & Silrey, New York, $2,200, and A. L. Terwilleger, Paterson, N. J., $1,873. The contract was awarded to A. L. Terwilleger. The appropriation of $2,250.00 was made for an iron beam bridge with brick arches between them. The royalty of 10% is to be paid by the contractor.

San Antonio, Tex.—It is reported that the Holland Trust Co., of New York, has filed a suit against the International Bridge & Tramway Co., of Laredo, for the foreclosure of $80,000 first mortgage bonds. The bridge is on the line of the road between Laredo, Tex., and Neuvo Laredo, Mex.

St. Louis, Mo.—Thompson & Gray, of this city, have, it is reported, been awarded the contract for putting stone abutments and piers on the St. Louis Division of the Missouri, Kansas & Texas. These piers will be for 10 bridges, and their combined cost is said to be about $200,000.

Topeka, Kan.—The County Commissioners have adopted the plans for a seven-span Melan bridge submitted as follows: One span 125 ft. in the clear, two spans 100 ft. each in the clear, two spans 86 ft. each in the clear, and two spans 54 ft. each in the clear; 605 ft. altogether. The question of issuing $150,000 bonds to be expended in the construction of the bridge will be voted upon at the next election.

The plans for an iron bridge submitted to the Commissioners has been estimated at $136,000, while the corresponding Melan bridge, with steel brackets and plank covering for sidewalks was estimated at $115,000. The plans adopted show the pillars and arches of the bridge the full width of the roadway and sidewalk 40 ft., and is estimated to cost $135,000.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, Rock Island & Pacific, quarterly, ½ per cent., payable Nov. 1.

Delaware, Lackawanna & Western, quarterly, 1¾ per cent., payable Oct. 21.

Keokuk & Western, semi-annual, 1 per cent., payable Oct. 1.

Maine Central, quarterly, 1½ per cent, payable Oct. 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Chesapeake & Ohio, annual, Richmond. Va., Oct. 22.

Cleveland, Cincinnati, Chicago & St. Louis, annual, Cincinnati, O., Oct. 30.

Concord & Montreal, annual, Concord, N. H., Oct. 8.

New York, New Haven & Hartford, annual, New Haven, Conn., Oct. 16.

Northern Pacific, annual, 35 Wall street, New York City, Oct. 17.

Poughkeepsie & Eastern, annual, New York, N. Y., Oct. 10.

St. Louis & San Francisco, annual, St. Louis, Mo., Oct. 29.

Toledo & Ohio Central, Toledo, O., Oct. 15.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *American Society of Railroad Superintendents* will hold its annual meeting at Hotel Brunswick, New York City, on Monday, Oct 14, at 10:30 a. m.

The *American International Association of Railroad Superintendents of Bridges and Buildings* will hold its annual meeting at New Orleans, La., Oct. 15.

The *American Street Railway Association* will hold its annual meeting at the Windsor Hotel, Montreal, Oct. 15 to 18.

The *Roadmasters' Association of America* will hold its annual meeting at St. Louis, Mo., Oct. 15, 16 and 17.

The *American Railway Association* will hold its fall meeting at New York City, Oct. 16.

The Engineers' and Architects' Association of Southern California meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The Engineers' Society of Western New York holds regular meetings the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets on the first Tuesday in each month, at 8 p. m. The headquarters of the society are at 1736-1739 Monadnock Block, Chicago. The business meetings are held on the first Wednesday at its rooms. The meetings for the reading and discussion of papers are held on the third Wednesday at the Armour Institute, Thirty-third street and Armour avenue.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7.30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

General Passenger Agents.

The American Association of General Passenger & Ticket Agents held its semi-annual meeting at Boston, Sept. 17, about 50 members being present. The regular address was by Mr. W. A. Turk, but he was absent, and his paper was read by Mr. C. A. Taylor. President W. M. Davidson resigned, and Vice-President D. J. Flanders, of Boston, is now acting president.

Northwest Railway Club.

The first meeting of the club for the fall season took place at the Hotel Ryan on Sept. 19, with an unusually large attendance. C. A. Seely read a paper on Lead of Locomotives, and J. P. Elmer described a recent trip through Venezuela. At the next monthly meeting on Oct. 7 officers for the coming year will be elected. It is also proposed to have a banquet on that evening.

American Street Railway Association.

Arrangements have been made for a special train from New York to Montreal, via the New York Central & Hudson River Railroad, for the delegates to the annual convention in the latter city, Oct. 15. The train will leave the Grand Central Station, New York city, Monday, Oct. 14, at 6 o'clock p. m., arriving in Montreal early the following morning. Delegates from the west will connect with the special train at Utica on Monday night. Inquiries relating to reservation of berths and tickets should be made at once and addressed to M. C. Roach, Eastern Passenger Agent, 413 Broadway, New York, or to any of the following members of the committee: John N. Partridge, Chairman, Secretary American Street Railway Association, Brooklyn, N. Y.; James H. McGraw, Havemeyer Building, New York, and C. W. Price, 13 Park Row, New York.

Engineers' Club of St. Louis.

The club met on Sept. 18, with President Russell in the chair. Mr. A. L. Johnson opened the discussion on The Inspection of Structural Steel. Mr. Johnson stated the ordinarily accepted definitions of the terms "elastic limit," "yield point" and "break-down point." He showed the difficulty of determining these characteristics, particularly with high grade steel, and doubted whether any existing method gave them exactly. In his opinion it is unnecessary to use them in practice as the ultimate strength and elongation are all that is really essential. Both Mr. Johnson and Mr. Moore said that their practice was to omit the elastic limit from their specifications. Mr. Johnson showed charts from tests recently made by Professor Gray, of Terre Haute, on one of the best existing pieces of apparatus for the purpose. These charts showed a practically straight line from the origin to the yield point.

Mr. Bryan, on the contrary, thought that the elastic limit, and not the ultimate strength, indicated what could be done with the material, and therefore advocated its determination. He thought it more important to know when a structure would begin to distort seriously

than when it would fail altogether. Mr. Moore said that since the ultimate strength and elongation could be accurately determined, to use these with a large safety factor would be more desirable than to use the elastic limit with a reduced safety factor. He called attention to the fact that in all standard materials the elastic limit bears a certain relation to the ultimate strength, which relation does not vary materially. After some further discussion, the meeting adjourned.

Western Society of Engineers.

On Tuesday, Sept. 24, at Armour Institute, Chicago, the Western Society of Engineers held a meeting postponed from Sept. 4. About 50 members were present. The result of the recent letter ballot on the resolution, "That the Western Society of Engineers withdraw from the Association of Engineering Societies," was announced. Two hundred and sixty-nine votes were cast, which is about 63 per cent. of the total membership of the Society. Of these 269 votes, 179 were in the affirmative, 87 in the negative, and 3 were rejected on account of irregularities. It was thus decided that the Western Society would withdraw, and the Secretary was instructed to notify the Association. After this withdrawal, it is the intention of the Western Society to publish their own proceedings, and it is hoped by those who favored the withdrawal to get out a larger number of papers than has been previously done.

The paper of the evening was "Some Notes on the Dry Docks of the Great Lakes," by Mr. Ambrose V. Powell, member of the Society. Mr. Powell's paper was a history of the construction of dry docks, more especially of those on the great lakes, with lantern slide illustrations of the dock at South Chicago, belonging to the Chicago Ship Building Company, that he constructed. The discussion on this paper was continued until next meeting.

The Society appointed the following members and associates as delegates to the first Annual Convention of the International Deep Waterways Association just held: Gen. O. M. Poe, Isham Randolph, Alex. E. Kastl, Capt. James S. Dunham, William Boldenweck, Lyman E. Cooley, Thomas T. Johnston, Eben J. Ward, Frank Wenter, Bernhard A. Eckhart.

American Society of Railroad Superintendents.

Secretary C. A. Hammond has issued the call for the twenty-fifth meeting of this society, which is to be held at Hotel Brunswick, New York City, on Monday, Oct. 14, beginning at 10.30 a. m. After the usual order of business, the following reports of committees will be heard: On Roadway, D. B. McCoy, Chairman; on Machinery, W. F. Potter, Chairman; on Transportation, T. F. Whittelsey, Chairman; on Signalling, W. G. Wattson, Chairman. Next comes the report of a special committee on the Relations of Railroads with their Employees, of which C. R. Fitch is Chairman, and this is to be followed by a paper on Roadway Department Economics by Mr. A. Morrison.

The Secretary announces the following topics for discussion:

(a) How far and with what advantage can the maintenance-of-way be placed under the jurisdiction of the superintendent?

What comparative records or statistics can be profitably adopted to secure economy in the renewal of track and roadbed materials, and in the maintenance of the same?

(b) Under what conditions of passenger or freight service has the compound locomotive proved of advantage?

Can electrical power be used on steam roads? Under what circumstances and with what efficiency?

(c) What are the best methods for securing the prompt handling and dispatch of fast freight?

What measures can and ought to be adopted to lessen the cumulative delays of through passenger trains?

(d) Shall we abandon all effort to obtain a "position" signal by night? If not, what progress has been made, or what practical suggestion can be offered in this direction?

Can the green, or caution, signal be safely abandoned in American practice? If not, can there be any improvement over white, green and red for night signals?

Ought not the installation of interlocking plants at all points where main-track switching has to be done precede the introduction of any system of block signalling?

(e) What are the best methods of securing good discipline among employees? Should a system of pensioning be adopted for employees who have rendered faithful and continuous service of twenty-five years or more?

There will be an election of a president, a secretary and a treasurer, for two years; of two vice-presidents for one year, and two members of the executive committee for two years; also the standing committees for the ensuing year. A cordial invitation is given to all railroad superintendents to be present. The fourth annual dinner of the society will take place at the Brunswick Monday evening.

American Society of Civil Engineers.

At the meeting of the Society, held Wednesday evening of this week, the following ticket was announced as having been presented by the Nominating Committee: President, Thomas Curtis Clarke; Vice-Presidents, William R. Hutton and T. Alex. Peterson; Treasurer, John Thomson; Directors, George A. Just, William Barclay Parsons, Horace See, John R. Freeman, Daniel Bontecou and Thomas W. Simons.

At the same meeting a paper was presented on the subject of Moving Two 36-in. Water-Mains Without Shutting Off the Water, an abstract of which paper we have already published.

On the evening of Wednesday, Oct. 16, 1895, a paper by Thomas C. Clarke, M. Am. Soc. C. E., entitled "Effect of Depth Upon Artificial Waterways," will be presented. On the evening of Wednesday, Nov. 6, 1895, a paper by William Starling, M. Am. Soc. C. E., on "The Discharge of the Mississippi River," will be presented. Abstracts of these papers are given below:

EFFECT OF DEPTH UPON ARTIFICIAL WATERWAYS.

To ascertain the cost of transportation between Chicago and New York, by way of the Great Lakes and Erie Canal, these data are necessary: *First*, the number of trips which steamers and barges can make during the season of navigation. *Second*, the annual cost of operating and maintaining large steamers and steam-towed barges. *Third*, the receipts per trip, which must be equal to the amount of the annual expenses divided by the number of trips, to prevent loss. It is assumed that the receipts per trip will be equally divided between the receipts from grain going East and merchandise going West.

The new steamer "Victory" is taken as a type of lake freighter. She is 389 ft. long by 48 ft. beam, and carries a cargo of 4,000 net tons at 14 ft. draft, 5,000 tons at 16 ft., 6,000 tons at 18 ft., and 7,000 tons at 20 ft. Her economical rate of speed on the lakes, in deep water, is 13 miles an hour. Half an hour is assumed to be the time required for lockages in a ship canal, and the same for a fleet of barges. Thirteen days is estimated as the time of detention in port in all cases.

From these data the author draws the following conclusions as to the cost of transportation from Chicago to New York under the conditions mentioned:

First.—Erie Canal deepened to 18 ft., to admit steamers carrying 5,000 tons on 16 ft. draft; 5 cents per bushel.

Second.—Erie Canal deepened to 25 ft., to admit steamers of 7,000 tons burden; 3.22 cents per bushel.

Third.—Erie Canal as it now exists; 4.73 cents per bushel.

Fourth.—Erie Canal deepened to 9 ft., and used by fleets of one tug and five 1,500-ton steel barges loaded to 7½ ft. draft; 4.4 cents per bushel, including trans-shipment at Buffalo.

Fifth.—The detailed estimates given in the paper show that one of the heaviest charges in the third and fourth cases is the item of 1.15 cents per bushel at Buffalo for trans-shipment of cargoes. If the Erie Canal were deepened to 9 ft., and its few short locks were lengthened, it would be possible to navigate the canal with fleets made up of four steel barges 180 ft. long, 17.2 ft. in beam, and loaded to 7½ ft. draft. They could be towed from Chicago to New York, and would carry a cargo of 2,400 tons or 80,000 bushels. The cost of transportation in this case would be 2¼ cents a bushel.

It is the object of the paper to call attention to the significance of these figures, which indicate that a ship canal ought to be not less than 25 ft. deep if it be intended to pass large lake vessels, and that a slight enlargement of the Erie Canal may allow fleets of steel barges to run from New York to Chicago, transporting freight at less rates than large lake vessels could in a 25-ft. canal, even were it used free from tolls.

THE DISCHARGE OF THE MISSISSIPPI RIVER.

The objects sought in the paper are twofold—

First.—What was the greatest discharge ever passed down the Mississippi, both between the banks and in the swamps or side-channels?

Second.—What height would such a flood have attained if it had all been restrained by levees? Better than all would it be to find out the general laws regulating the relations of the discharge to the gage, so that not only the height corresponding to the maximum discharge, but to any discharge, at any time, past, present or future, may be ascertained.

The flood of 1882 is thought to be the greatest ever known. Attempts were made to measure it, but a large part of the discharge passed over the banks, and the estimates made of the escaping water were very crude. High-water observations are subject to many errors, but the behavior of a river while within its banks is comparatively regular. It is believed that the best chance of success lies in studying the laws which regulate the progress of the discharge at stages of bank-full or less, and applying them by analogy to greater heights.

Discharge curves are disappointing at first. They appear like skeins of tangled thread. To understand the causes of the apparent anomalies pervading them, it is necessary to go back to the first principles of river hydraulics. There are several terms which are employed with great latitude. Some of them are "mean velocity," "water prism," "equilibrium between accelerating and retarding forces" and "fluid friction." The general formulas are all more or less vitiated by the lack of precision in the definition of the quantities entering into them. The paper urges that the most general formula, $v = c\sqrt{rs}$, is inapplicable to rivers in general for several reasons:

First.—It depends on the hypothesis of uniform motion, which is not even approximately realized in large rivers.

Second.—It is taken for granted that the stream is always in a state of equilibrium between the force of gravity and the resistances.

Third.—The formula is founded on the supposition that the only resistance encountered is that of friction.

Fourth.—It is assumed that the symbol v represents the mean velocity, in its ordinary acceptation.

Fifth.—It is assumed that the bed of the river, even though irregular, is unalterable.

Sixth.—The only expression for the slope that is available is not the slope of the formula, and does not bear a definite relation to it, unless by accident.

In view of these objections, it is held that it would be difficult to arrive at a general formula adapted to channels of all sizes and conditions. It is even difficult to devise a formula which shall be suited to large rivers, or to an individual river at all slopes, places and stages. It is believed, however, that there is a chance of success in searching for local formulas, adapted to particular places, and perhaps to particular stages.

After much careful discussion of general conditions the question of the maximum discharge is taken up, and the observations of 1882, and of other great flood years at Columbus, New Madrid, Helena, Arkansas City and Wilson's Point are analyzed, discharge curves plotted, and the probable discharges calculated. Incidentally to this investigation, the influence of the Saint Francis and the White River basins acting as reservoirs is discussed. In the same connection, the effect of the discharge of large volumes of water across unleveed points is considered, including the influence of backwater in such situations.

The question of the discharge of the tributaries and its effect on the main river is examined, as shown in the instances of the floods of the Arkansas and White rivers in 1882, 1884-85, 1890, 1892 and 1893. The united discharge of a stream and a tributary is never equal to the sum of the separate discharges; first, because the crests of the two floods do not coincide in time; and second, on account of the reservoir influence of the channels and flood plains. The effect of the reservoir influence of the White River basin is submitted to a calculation.

The maximum discharge of 1882 at several points is then estimated, and the probable gage heights which it would have reached in a confined river are determined approximately. The estimates given are subject to several deductions; first, from the reservoir influence of the channel and flood plain of the main river between Columbus, where the maximum discharge of 1882 was taken, and the lower stations of Helena, Arkansas City, etc.; second, from the discharge over banks at the observation points, of which no account was taken in the calculations; third, from the effects of so-called water-banks, that is, from the substitution of banks of water for banks of earth in the upper parts of the section, at stages over bank-full; and perhaps from other causes not known. The conclusion is that the total discharge of 1882 at Arkansas City was about 1,735,000 cu. ft., and that it would have passed at a gage height of about 55.8 ft.

The floods of more recent years are examined, and it is shown that none of them, except probably 1884, had so great a discharge as that of 1882. The low-water discharge is briefly considered. Above Red River, the lowest record fluctuates in the neighborhood of 100,000 cu. ft.; below Red River it is about 140,000 cu. ft. There has apparently been a depression of the low-water plane at Wilson's Point in the last four years. Tables are appended showing the distance and elevations of the various gage stations on the lower Mississippi, and giving a list of the discharge observations made or published by the Mississippi River Commission.

Mr. Starling's paper is a long one, occupying about 130 pages of *Transactions*.

PERSONAL.

—Mr. Russell Houston, chief attorney of the Louisville & Nashville road, died in Louisville, Ky., Oct. 1. He was 85 years old.

—Mr. J. L. Laidlaw, one of the directors of the Toledo, St. Louis & Kansas City, and Vice-President of the company, has been elected Treasurer, succeeding Mr. W. Howard Gilder, who has held that office for some time.

—Mr. Frank H. Constant, until recently Assistant Engineer with the Osborn Company, Civil Engineers, of Cleveland, O., has accepted a position as instructor in Civil Engineering in the University of Minnesota at Minneapolis.

—Mr. L. F. Parker has been recently appointed General Attorney of the St. Louis & San Francisco road in charge of the Legal Department of that company. He succeeds Mr. McKenna, who takes charge of the legal affairs of the Atchison under the recent appointment of Judge Caldwell.

—Mr. Leverett S. Miller, of St. Paul, one of the joint receivers of the Central Washington road and Assistant General Manager of the St. Paul & Duluth, has resigned as receiver of the former road, and Mr. C. B. Chamberlain has been continued in charge of the property as receiver.

—Mr. Joseph Bell, who died in England on Sept. 7 at the age of 83, was a locomotive engineer until two years ago, having served on the London District Railway for 18 years, and was at one time the runner of the Rocket, Stephenson's pioneer locomotive. Mr. Bell's death was the result of an accident, and not of old age.

—Mr. Edward W. Thompson has recently been appointed Traffic Manager of the Baltimore Steam Packet Co., which operates steamers from Baltimore in connection with the Seaboard & Roanoke road. This is a new office with the company, and the steamship business is a new one for Mr. Thompson. He has been a railroad man for many years. Recently he has been a representative of the Central Vermont road in the White Mountains, and New England Passenger Agent of the Chicago, Rock Island & Pacific road.

—Mr. George W. Creighton has been appointed Superintendent of the middle division of the Pennsylvania to succeed Mr. Frank Ellmaker, resigned. Mr. Creighton is at present Superintendent of the Sunbury division of the Philadelphia & Erie, and the Shamokin division of the Northern Central. He will be succeeded in the latter position by A. E. Reed, present Superintendent of the Lewiston division; Victor Wierman, Superintendent of the Bedford division, will succeed Mr. Reed, and Mr. Wierman will be succeeded by Wm. B. McCaleb, Assistant Engineer of the middle division of the Pennsylvania.

—Mr. W. R. Burt has been elected President of the Ann Arbor Railroad, which has been organized to succeed the Toledo, Ann Arbor & North Michigan. Mr. Burt was appointed receiver of the latter road in 1893 and has since administered the property. He is connected by family relations with the Ashleys, who have been the managers of the road for many years. It is understood that Mr. H. W. Ashley will continue in charge of the operation of the new road as General Manager. Mr. D. C. Tate, who has been the financial agent of the company in New York City, has been elected Secretary and Treasurer of the new company.

—General O. M. Poe, the officer of the United States Corps of Engineers in charge of the Sault Ste. Marie Canal, died suddenly at his home in Detroit on Oct. 2. General Poe was graduated from West Point in 1856, and was assigned to duty with the Topographical Engineers. He organized a regiment of volunteers at the outbreak of the Civil War, and in 1862 became Brigadier General of Volunteers. He was also Chief Engineer of an army corps, and served in an unusually large number of important campaigns. His most important recent work was in connection with the "Soo" Canal, the new locks of which he was just completing. General Poe was born in 1832, and would have reached the age for retirement next year.

—Mr. Julius Kruttschnitt, General Manager of the Atlantic System of the Southern Pacific, has been appointed General Manager of the Pacific System, succeeding the late A. N. Towne. This appointment places him in office as General Manager of all the lines operated by the Southern Pacific. He entered railroad service in 1878, on Morgan's Louisiana & Texas Railroad and when that line and the Morgan Steamship Lines were purchased by the Southern Pacific he became the Assistant Manager of the Atlantic Lines of the Southern Pacific, being afterwards promoted to be General Manager of the entire Atlantic System, and since then his headquarters have been at New Orleans. On Friday of last week he left that city for San Francisco, which will hereafter be his headquarters. Mr. Kruttschnitt is now in the prime of active business life, being a little over 40 years of age.

—Mr. Sol Haas, Assistant to the President of the Southern Railway, has resigned. Mr. Haas had been appointed to that office soon after the organization of the company, being in charge of the traffic department of the company under President Spencer, who retained direct supervision traffic matters. Mr. Haas stated in New York last week, while attending a meeting of the Southern Freight Association, that he had determined to retire entirely from railroad service. Mr. Haas had been connected with the Richmond & Danville as Traffic Manager, for many years previous to the organization of the Southern Railway. He was one of the best known of Southern traffic men and had been engaged in that department of railroading since 1868. In 1880 he became General Freight Agent of the Richmond & Danville, and two years later was made General Freight Agent of the Associated Railways of the Virginias and Carolinas, and Traffic Manager of these roads and of the East Tennessee, Virginia & Georgia, in 1887, but a few years later he resigned to become General Traffic Manager of the Richmond & Danville, an office which he retained until that company went out of existence.

—Mr. George H. Vaillant, formerly Vice President of the New York, Lake Erie & Western, died at Bristol, R. I., on Sept. 30, of a complication of diseases. Mr. Vaillant was well known as a traffic officer, having been for about 10 years Traffic Manager of the New York, Lake Erie & Western, and with the Lake Shore road during his whole previous career. For the last year or so he has not been able to attend to any business. He suffered from a paralytic stroke over a year ago. He recovered from this sufficiently to be able to go to his office, but could continue his duties for only a short time. He has since been traveling both in this country and in Europe, but he was constantly declining

in health and some months ago he went to Bristol, R. I., the end of his sickness being then no longer in doubt. Mr. Vaillant was born in France, but came to this country at a very early age, and before he was 15 was a clerk in a railroad office at Cleveland. In 1885 he left the Lake Shore & Michigan Southern, of which he was then General Freight Agent, to go to the New York, Lake Erie & Western as Freight Traffic Manager. He had that office until 1891, when he became a Vice-President of the company, continuing in charge of the traffic department of the company as long as he was able to give any attention to business. Mr. Vaillant will be remembered by those who knew him familiarly as a cheerful, lively, amiable and enthusiastic friend, who never spoke ill of another, and who always wished well to all mankind.

—The new Northern Pacific receivers succeeding Messrs. Rouse, Oakes and Payne, are Messrs. Edwin H. McHenry, of St. Paul, and F. L. Bigelow, of Milwaukee. Mr. McHenry is the present Chief Engineer of the Northern Pacific road and has been in its service for many years. He became Chief Engineer in 1893 when that office became vacant by the promotion of Mr. Kendrick to be General Manager of the road. Previous to that appointment Mr. McHenry has been Principal Assistant Engineer of the road in charge of the Western Division, and in that position had charge of the the construction of the large mileage of branch roads built by the Northern Pacific in Washington and adjoining states a few years ago. Mr. Bigelow is a banker, Vice-President of one of the Milwaukee National banks, of the Milwaukee Street Railway Co., and other local corporations. He has been associated with Mr. H. C Payne, one of the recent Northern Pacific receivers, in various business enterprises, and for this reason there in considerable surprise at his appointment, as Judge Jenkins, in accepting the resignations of the former receivers, said that he would appoint no one identified with any of the contending interests in the property. Some of the attorneys who have opposed the management of the re cent receivers objected to the confirmation of these appointments in the United States Circuit Courts at St. Paul, the chief objection being the appointment of Mr. Bigelow, but Judge Sanborn, of that district, has also appointed the two receivers named by Judge Jenkins.

ELECTIONS AND APPOINTMENTS.

Boston & Albany.—At the annual meeting last week the stockholdrs re-elected the present Board of Directors except that Albert C Houghton of North Adams, Mass., was added to the board, vice Moses Kimball, deceased. Mr. Houghton has been state director of the Fitchburg road, and is now a director of the West End Street Railway Co., of Boston. He is also president and active manager of the Arnold Print Works of North Adams.

Burlington & Missouri River.—G. P. Faucon has been appointed Car Accountant of this road, vice M. McKinnon, resigned, in addition to his present duties connected with the handling of passenger equipment.

Chicago, Rock Island & Pacific.—E. P. Brinegar has been appointed to represent the passenger department in New England, and F. E. Meek will succeed him as Traveling Passenger Agent, with headquarters in Omaha.

Cleveland, Akron & Columbus.—Messrs. Squire, Sanders & Dempsey have been elected Counsel for this company in place of J. H. Hoyt, Counsel, and H. T. Mathers, General Attorney, resigned.

Fitchburg.—At the annual meeting at Boston, Sept. 25, the directors were re-elected and Edward D. Codman added to the board.

New Orleans & Northeastern.—President Harvey announces the removal of the general offices of the New Orleans & Northeastern, the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific from Cincinnati, O., to New Orleans, La., on Oct. 1. The general officers of these companies, with headquarters at New Orleans, will be C. C. Harvey, President; John Glynn, Jr., Treasurer; I. Hardy, General Freight and Passenger Agent; Larz A. Jones, Auditor, and Harry H. Hall, General Counsel. Communications heretofore addressed to the General Manager or to the Purchasing Agent should hereafter be made to the President.

New York, Ontario & Western.—The annual meeting of the Company was held in New York September 25. The number of shares represented in person and by proxy was nearly 400,000, out of a total of 580,000. C. Ledyard Blair, of the banking firm of Blair & Co., New York, was elected to fill the vacancy in the board caused by the death of E. K. Sibley. The other directors were re-elected.

Southern.—H. W. Woolf has been appointed Freight Auditor, with office at Washington, D. C. All freight reports, copies of way-bills and correspondence relating thereto should be addressed to him.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Bangor & Aroostook.—Four miles of rails have been laid on the Ashland branch of the road, and as soon as a rock cut is removed ten more miles can be laid. It is expected to reach Ashland with the rails early in November.

Belt Railroad Co. of Chattanooga.—This company has been organized, with $300,000 capital stock. This company represents the purchasers of the old Union Railway, and will shortly affect a lease of its property for 50 years to the Alabama Great Southern road, which company is controlled by the Southern Railway.

Buffalo, Rochester & Pittsburg.—The company is putting down new 80-lb. rails on its Pittsburg division. Between Elks Run Junction and Stanley, Pa., 13½ miles will be entirely relaid, and the remainder of the 4,000 tons ordered will be put in at curves and elsewhere, where needed. The new rails replace 60 and 71 lb. sections. Already 36 carloads have been reshipped from the Lackawanna junction to DuBois, and the work will be pushed along as rapidly as possible.

Chicago Great Western.—The DeKalb branch of this line, built under the name of the DeKalb & Great Western, was opened for traffic last week. The train service established at the opening of the line includes five trains each way daily over the new road. The branch is about six miles long and extends from Sycamore to the town of DeKalb, connecting with the Chicago & North Western. Sycamore is a station on the Chicago Great Western, about 50 miles west of Chicago. The grading on the line was begun in April last by the firm of Foley Brothers, of St. Paul, Minn.

Chittenango & White Sulphur Springs.—Articles of incorporation were filed in New York last week for this road, which is to be operated in Madison County and to have a capital of $150,000. The following are the board of directors: Charles F. Pennock, George C. Clark, Luke McHenry, William H. Young, Walter J. Roberts, Austin J. Roberts, John B. Dickinson, Henry G. Blackmar, Henry E. Parsons and J. Franklin Clark.

Cincinnati, Jackson & Mackinaw.—It is reported that nearly all the right of way for the extension of this road to Jackson, Mich., has now been secured. The surveyors have located a line following a nearly direct route, and it is expected that as soon as the company completes the right of way purchases it will award the contracts for grading the new line, which will require the construction of about 20 miles of road. The road crosses a broken country, and the grading will be quite heavy. There is very little bridging and no long spans.

Flint & Pere Marquette.—The company is extending its Harrison branch northwest, and now has it partially completed almost to the Muskegon River. The objective point is not made public, as the surveyors work only a mile or so ahead of the grading forces.

Indiana Central.—The Commissioners of Huntington County, Ind., have ordered an election for Nov. 1, to decide whether $22,000 shall be appropriated in aid of this road, projected from Union City to a junction with the Chicago & Erie.

Pennsylvania.—The time for raising the $100,000 by the citizens of Barnegat Island and towns in the vicinity on the South Jersey coast, in accordance with the agreement of the Pennsylvania road, has been extended until Nov. 30. Under this agreement the citizens are to secure subscriptions amounting to $100,000 for the construction of a branch road to the Pennsylvania from a point on its present line to Manahawkin, the Pennsylvania agreeing to give a like sum for completing the construction of the road if this amount was raised by the citizens, and also agreeing to operate it as one of its branches. It is said that so far about $60,000 has been raised, and those in charge of the local subscription papers being quite confident that the balance can be raised, President Roberts has agreed to extend the time for securing the required sum from September until Nov. 30.

Quebec Central.—The long branch of this line into Southeastern Quebec, connecting with the Canadian Pacific near the main boundary line at Lake Megantic, has just been opened for traffic. The Dominion Government Engineer, Mr. Thomas Ridout, made his inspection trip over the new line last week, and the construction of the line being satisfactory, the company was authorized to begin traffic. This branch begins at Tring Station, on the Point Levis Division of the company's lines, and extends southwesterly about 60 miles to a connection with the Canadian Pacific line which runs through the state of Maine, the junction being made near Lake Megantic, as already stated. The construction of the new line shortens the time from Quebec and the other important cities of Canada to Nova Scotia and the other Canadian maritime provinces.

Sandy River.—Important improvements are now being made on this 2-ft. gage road in Western Maine. There are 18 trestle bridges on the present line of 18 miles between Phillips and Farmington, Me., which it is proposed to fill in. W. D. Smith, of Bangor, Me., has the contract to fill in most of these trestles and for building two new bridges and a number of important culverts. It is said that this contract amounts to about $50,000. Work has been commenced on filling in the trestle at Strong, which is 856 ft. in length and from 30 to 40 ft. high for most of its length. About 55,000 cu. yds. of earth will be required for this fill. Two stone abutments and an iron span 150 ft. in the clear will be put in. This work is in charge of A. L. Hilton as Chief Engineer.

Toronto, Hamilton & Buffalo.—President Van Horne, of the Canadian Pacific, has given the details of the agreement made some weeks ago between the New York, Central & Hudson River, Michigan Central, Canada Southern and Canadian Pacific, on the one side, and the T., H. & B. on the other. This agreement, President Van Horne says, provides that the above company shall, in addition to its present line from Waterford to Hamilton, Ont., find the funds for and complete a line from Hamilton to Welland, and another from Hamilton to Toronto, the latter section to be a double track one, and provides that the four first-named companies shall set aside a certain percentage of their earnings on traffic received from or delivered to the T., H. & B., for the purpose of meeting any deficiency in the net earnings applicable to the interest on the T., H. & B. bonds. "And in consideration of this undertaking the four companies named are to receive a majority of the T., H. & B. stock, and are to be represented by a majority in the Board of Directors, thus having control of the management." The section between Hamilton and Toronto is to be leased to the Canadian Pacific and to be operated as one of the lines of that company. The rest of the road will be operated by the T., H. & B., under the direction of the four companies before mentioned. These four companies have nothing to do with procuring the necessary capital for building the line. The liabilities of the four companies is limited to the percentage of their earnings on business interchanged, and the promoters of the new road are liable to the four companies only for nominal damages in the event of their failure to complete the road.

Tuscarora Valley.—The track has now been laid on the extension of this line from East Waterford, Pa., through the Path Valley to Blair's Mills. This line was begun early in the spring, and is only 10 miles long. The present intention is not to build beyond Blair's Mills, which is about nine miles from Dry Run, the proposed final terminus of the extension.

Washburn, Bayfield & Iron River.—The election in Bayfield County, Wis., last week, on the proposition to issue county bonds to the amount of $240,000 to aid in the construction of this road, was carried by a large majority. The road has been projected to extend from Bayfield, on Lake Superior, to Iron River, Wis., where a junction is made with the Ashland line of the Northern Pacific and with the Duluth, South Shore & Atlantic road. The new line has been surveyed, the distance between the two points by the route selected being about 70 miles.

GENERAL RAILROAD NEWS.

Altoona & Phillipsburgh Connecting.—This road was to be sold at Altoona, Pa., at sheriff's sale on Oct. 2 of this week. The company at present operates about 13 miles of road between Phillipsburgh in Center County to Ramey in Clearfield County, its chief purpose being to reach certain coal mines in the latter county. It is projected to enter Altoona, Pa., but the company has been delayed in the development of its property by numerous legal complications. The town of Ramey is about five miles from Altoona.

Ann Arbor.—The organization of this company, which succeeds the Toledo, Ann Arbor & North Michigan, is progressing rapidly, and the Reorganization Committee expects to turn over the property to the new company within a few weeks. The directors of the new company have been elected, as announced last week, and this week the organization of the company has been completed. The new company has been organized with a capital stock of $7,250,000. Of this amount $2,000,000 is preferred stock and $3,250,000 is common stock. The bonded indebtedness will be $7,000,000 bearing four per cent. interest. The Reorganization Committee, directors, and others interested in the new company, last week made a tour of inspection of all the lines of the company. It is announced that the Escanaba, Frankfort & Eastern, which was organized some months ago to operate the division to Frankfort on Lake Michigan, will be operated by the new company as well as the steam ferry transfer across Lake Michigan.

Canadian Pacific.—The earnings for August are reported as follows:

	1895.	1894.	1893.
Gross earn.	$1,675,363	$1,605,552	$1,873,626
Oper. expense.	1,027,986	1,080,296	1,138 890
Net earn.	$647,377	$575,256	$734,736
Prop. exp. to gross earn.	61⅜	65¼	60¾
Net eight months.	3,744,228	3,335,754	4,494,943

Central of New Jersey.—The company makes the following statement of earnings for August:

August.	1895.	1891.	Inc. or dec.	
Gross earn.	$1 277,399	$1,155,846	I.	$121,553
Oper. exp. and taxes.	708,572	746,287	I.	34,712
Net earn.	568,826	412,556	I.	156,270

Central Washington.—Judge Hanford, of the United States Circuit Court for the Washington District, has made Charles P. Chamberlain, of Spokane, sole receiver of this road, which is a branch of the Northern Pacific. Heretofore the road has been operated by L. S. Miller, of St. Paul, and C. P. Chamberlain as joint receivers. Judge Hanford has also appointed the Knickerbocker Loan & Trust Co. Trustee for the bondholders, in place of the Farmers' Loan & Trust Co., of New York. This line was built a few years ago through what is known as the Big Bend country, along the Columbia River, in Washington, the great grain-producing section of the state, as a feeder for the Northern Pacific. There is now some talk of the bondholders taking charge of the road and operating it as an independent line, but, so far, no definite action has been taken in this direction.

Chicago, Burlington & Quincy.—The detailed actailed account of August receipts makes the following comparison:

August.	1895.	1891.	Inc. or dec.	
Freight.	$1,940,417	$1,809,202	I.	$131 215
Passenger.	784,348	686,689	I.	97 658
Mail, etc.	349.432	348,253	I.	1,179
Total gross.	$3,074,196	$2,934,144	I.	$140,052
Since Jan. 1:				
Freight	$12,019,342	$13,350,007	D.	$1,330,665
Passenger.	4,774,698	4,638,786	I.	135,912
Mail, etc.	2,672,856	2,567,085	I.	110,771
Total gross.	$19,466,896	$20,550,878	D.	$1 083,982

Chicago, Milwaukee & St. Paul.—The earnings for August and the two months since June 30 are given below:

August:			
Gross earn.	$2,662.985	I.	$169,958
Oper. exp.	1,641,351	D.	26,804
Net earn.	$1,021,334	I.	$193,712
From July 1:			
Gross earn.	$4,952,226	I.	$679.922
Oper. exp.	3,193,598	I.	124.386
Net earn.	$1,758.628	I.	$555.536

Cleveland, Cincinnati, Chicago & St. Louis.—The earnings for August are reported as follows:

	1895.	1894.	1893.
Gross earn.	$1,292,294	$1,216,077	$1,207,142
Op. expenses.	926,359	888,481	896,478
Net earn.	$365,934	$327,595	$310,664
Fixed charges.	233,823	233,857	224,204
Surplus.	$132,111	$93,738	$86,460
Prop. exp. to gross earn.	71 2-3	73¾	74¼
Net two months.	606,142	437,3 5	547,241
Surp. two months.	137,241	Def. 34,009	Surp. 104,654

Georgia & Alabama.—At a meeting of stockholders in Americus, Ga., last week, an issue of $2,210,000 of first mortgage preference five per cent. gold bonds was authorized; also, an issue of $5,270,000 of first mortgage consolidated five per cent. bonds, of which $2,210,000 are to be reserved in the hands of the Trustees to retire the first mortgage preference bonds.

Illinois Central.—A special meeting of the stockholders has been called for Nov. 26 for the purpose of voting upon an increase of the capital stock of the company from $50,000,000 to $60,000,000. The new stock is to be offered to present shareholders at par, one share of the new stock for every five owned.

Louisville & Jeffersonville Bridge Co.—It has been learned that the entire issue of $3,000,000 fifty-year four per cent. gold bonds of the company, which was purchased by A. A. H. Boissevain, has been sold in Europe at 94 and interest, Amsterdam basis. The bonds are guaranteed by the Chesapeake & Ohio and by the "Big Four."

New York, Lake Erie & Western.—It is announced that the foreclosure sale of this property has been fixed for Nov. 6. The Reorganization Committee announces that the securities included in the reorganization plan must be deposited with J. P. Morgan & Co. by Oct. 25. Bonds not deposited by that date will be received only on such terms as the committee may hereafter determine. The committee announces that the second installment of the assessment on the stocks will be payable Oct. 21, the third Nov. 21, and the fourth Dec. 23, $2 being due on each share of preferred stock on each of these dates and $3 on the common stock.

It is announced that a syndicate has been organized in New York by Harvey Fisk & Sons, which has purchased $15,000,000 of the issue of first consolidated prior lien bonds authorized under the reorganization plan.

New York, Ontario & Western.—At the annual meeting, held last week, President Fowler made an address advocating the continuance of the voting trust. Vice-President Price seconded Mr. Fowler, and a resolution was passed continuing the trust. There was no discussion of the question of classifying the capital stock. It is understood that the new stock will be used principally to complete the purchase of the first mort-

gage bonds of Chesapeake, Ohio & Southwestern. About $1,200,000 will be used for improving the lake front in Chicago, and there will be about $1,300,000 for other purposes.

Northern Pacific.—E. W. McHenry, of St. Paul, and F. G. Bigelow, of Milwaukee, were last week appointed receivers of this property by Judge Jenkins, of the United States Circuit Court at Milwaukee. These succeed receivers Rouse, Oakes and Payne. Judge Jenkins said that the third receiver would not be appointed until after consultation with the other judges of the other United States Circuit Court through whose jurisdiction the railroad extends. He added that very probably no additional receiver would be appointed, at least until it was evident that the company could be better administered by the appointment of an additional receiver. Mr. McHenry is Chief Engineer of the company, and Mr. Bigelow is a banker, as told in another column.

Judge Sanborn, in the United States Circuit Court, at St. Paul, has confirmed Judge Jenkins' appointment of Messrs. McHenry and Bigelow as Receivers. This action was taken by Judge Sanborn after argument by counsel for the Farmers' Loan & Trust Co. and the Reorganization Committee in favor of confirmation, and counsel for the stockholders and the committees of second and third bondholders against confirmation. Judge Sanborn again judicially recognizes Judge Jenkins' court as the court of primary jurisdiction. Judge Sanborn's circuit includes the State of Minnesota, where the headquarters of the company are situated, and also North Dakota.

C. B. Van Nostrand, of New York, a bondholder of the company, has filed a suit in the United States Circuit Court at Seattle in behalf of the third mortgage bondholders, asking to be made a party to the foreclosure suit now pending. He alleges that he represents the holders of nearly $2,000,000 of the third mortgage bondholders, and claims that as the Farmers' Loan & Trust Co., the plaintiff in the existing foreclosure proceedings, is trustee under several bond issues of the company, including the second and third mortgage bonds, the interests of the latter bondholders are not properly protected by that company, and that they should have a distinct representation in the present proceedings.

Attorney-General Childs, of Minnesota, has made application for an injunction to prevent the Great Northern from carrying out its plan of consolidation with Northern Pacific until the suit now pending in the State courts can be determined. Application for injunction will be heard Oct. 5.

Old Colony.—At the annual meeting of the stockholders, at Boston, Sept. 24, it was voted to authorize the directors to issue $2,000,000 of 50-year six per cent. bonds. In speaking about this issue, President Choate said the New Haven road, the lessee of the Old Colony, was now carrying out the change of grade at Brocton and on the Providence Division for five miles and other large projects of improvement. Of the $2,000,000 of bonds authorized to be issued at the last annual meeting, $500,000 had already been issued, $1,100,000 would be required to meet the bonds maturing next year, and $200,000 to pay off a note, thus leaving a margin of only $200,000 for all other needs.

Oregon Improvement Co.—Elijah Smith, the recently elected President, has issued a circular to the stockholders, explaining the default in the October interest on the consolidated mortgage bonds. He says: "The financial condition of the company on the Pacific coast, including the condition of the steamship and railroad companies, all the stock of which is owned by the Oregon Improvement Co., was as follows when the new management came into power: Cash, $22,669; coal on hand, $118,744, supplies and materials, $232,432; accounts receivable ($745,499) less accounts receivable ($538,713) $206,786; total, $580,630. Since July 1 there has been received in New York from the San Francisco office $58,000, now on hand. The only debt now owed in New York is the $107,310 due the sinking fund. The total amount that will be due by Dec. 1 is stated by President Smith as follows: Overdue to the sinking fund, $107,310; coupons due Oct. 1, $155,300; coupons due Dec. 1, $150,000; sinking fund due Dec. 1, $25,000; total due, $437,610; cash on hand in New York, $58,000. It is estimated that the net earnings of the company, between the present time and Dec. 1, together with the cash on hand, will merely pay the first mortgage and sinking fund requirements. Large sums will be needed for repairs to steamships and coal mines.

Oregon Short Line & Utah Northern.—A decree of foreclosure against the road was signed by Judge Riner, at Cheyenne, Wyo., last week, upon request of Judge Sanborn. It is ordered that if the interest indebtedness is not paid within 30 days the lines comprised in the mortgage shall be sold to satisfy it.

Philadelphia & Reading.—The statement of earnings of the railroad company for August was as follows:

	1895.	1894.	Inc. or dec.
Gross earn	$2,906,416	$1,783,665	I. $122,751
Oper. expen	997,044	1,009,057	D. 12,013
Net earn	$909,372	$774,607	I. $134,764
Other income	24,280	23,892	I. 687
Total	$933,952	$798,520	I. $135,451
Fixed charges	860,400	877,865	D. 17,464
Surplus	$73,552	Def. $79,365	I. $152,197

Pittsburgh, Cincinnati, Chicago & St. Louis.—The controversy which arose some years ago between the city of Cincinnati and this road concerning the use by the railroad of a portion of Eggleston avenue, and which, by the action of the State Canal Commission, has developed into a case of the State of Ohio against the railroad company, was partially settled at a recent conference between the railroad officials and the canal commission at Columbus, O. The portion of the avenue under dispute is from Broadway to the Ohio River, a distance of about 3,600 ft., and along the bed of the old Miami canal. This property, with some adjoining property, has been reclaimed by the state. It is not on the main line of the road, but has been occupied by the company for 20 years, and has become quite important to its interests, owing to the location of several sidings to large warehouses. The train-shed and freight house occupy the principal part of the avenue from Pearl street to Front street, the parallel street between Pearl and the river. The Supreme Court recently decided that the railroad company should vacate the property unless a satisfactory agreement could be made within 120 days to lease it. The conference at Columbus, which was brought about by the above decision, was partially successful.

The Commissioners' appraisement of the property which is to be the basis of the valuation upon which the lease will be made was $300,000 for that portion from Broadway to Pearl street and $57,000 from Pearl street to the river. The company's valuation upon the property was $52,000 from Broadway to Pearl street and $23,000 from Pearl street to the river. The company argued that there was a doubt as to the state having authority to lease the property, citing a decision of the Supreme Court, and threatened to carry the case to the United States Supreme Court; but the Commissioners intimated that they had been offered a much higher figure than the appraisement by another corporation, and the railroad company agreed to file its acceptance of that tract between Pearl street and the river, asking that it be given a lease for 15 years at an annual rental equal to six per cent. of the appraised value, $57,000. The disposition of the remainder, from Pearl street to Broadway was left unsettled. The Commissioners say that before going before the Supreme Court for further action the case will be submitted to Attorney-General Richards for advice. As the matter now stands the company practically controls the entire tract. By leasing from Pearl street to the river it shuts out its competitors from the property.

The accompanying diagram shows the situation of the property in question.

The terminal passenger station and yards of the railroad company are in the square bounded by Pearl street, Eggleston avenue, Front and Butler streets. The yard also covers Eggleston avenue and the land east of it (B), the main line running out in the direction of the index shown at *C*. The track through Eggleston avenue is shown by a heavy line in the center of the street. This track extends northwesterly from the yard (at *B*) about 3,000 ft. For this portion of the property the railroad company admits occupancy only of ground actually occupied by the track; that is, a space 8½ ft. wide. Most of the side tracks to industries are owned by the railroad company. Those indicated by broken lines are owned by private parties. The grounds claimed by the state south of Pearl street are covered by diagonal lines. The total area used by the railroad and claimed by the state south of Pearl street is 37,935 sq. ft., and north of Pearl street 38,962 sq. ft.

Eggleston Avenue Tracks of the Little Miami Railroad, Cincinnati.

Savannah & Atlantic.—The decree for the sale of the road, on Oct. 5, was filed in the United States Court at Savannah last week by Judge W. D. Harden. The property will be sold by Col. John Screven and Mr. J. N. Talley, who have been appointed by Judge Speer as commissioners to conduct the sale. The road will be operated by the reorganized Central of Georgia.

Southern.—Below is a statement of earnings and expenses for the month of August, 1895, and for two months from July 1, 1895, compared with the same periods for the year 1894:

	1895.	1894.	Inc.
Month of August:			
Mileage	4,494	4,494	
Gross earn	$1,538,578	$1,492,074	$46,503
Exp. and taxes	1,075,863	1,067,634	8,230
Net earn	462,715	424,440	38,273
Per cent. exp. to earn	70	72	
Two months to Aug. 31:			
Gross earn	$3,025,515	$2,815,118	$210,397
Exp. and taxes	2,210,012	2,132,717	77,294
Net earn	815,503	682,409	133,103
Per cent. exp. to earn	73	76	

TRAFFIC.

Traffic Notes.

The Chicago, Burlington & Quincy has decided to abolish storage charges on baggage, except at large stations.

The negroes from Alabama who emigrated to Mexico several months ago have had to return, and they are entirely destitute. Four carloads started from Eagle Pass, Tex., for Alabama on Sept. 26, and it is said that the railroads carried them without charge, expecting to ask Congress for an appropriation to reimburse them.

It is reported that the shipments of fresh fruit from Central California eastward this year, up to Sept. 1, were only 2,990 cars, as against 4,280 cars during the same period of 1894.

Fowler & McVitie, vessel agents at Galveston, announce a regular line of steamers from that port direct to Manchester "through the co-operation of the Manchester Canal Company."

The organization of the new Southern Freight Association is still unfinished, and the obstacles to an agreement are so numerous and persistent that the last meeting in New York City was adjourned to Oct. 15. It appears that there will be no election of Commissioner until that time.

A press despatch from Louisville says that the traffic officers of the Pennsylvania and the Louisville & Nashville are considerably exercised over a question of passenger traffic. Under a traffic agreement of long standing the latter road has delivered east-bound passengers to the Pennsylvania at Cincinnati, and vice versa, but this year the Pennsylvania put on a through train to Pittsburg via Indianapolis, which took a good deal of the business from Louisville. But the G. A. R. business broke the camel's back. Eastern agents of the Louisville & Nashville helped to get the business, and then the Pennsylvania took every car direct to Louisville by way of Indianapolis.

Chicago Traffic Matters.

CHICAGO, Oct. 2, 1895.

The freight rate situation has somewhat improved eastbound, and is no worse in the West. It is generally conceded that the eastbound lines are acting in a more conservative manner and are becoming cautious about doing anything that will create any further demoralization pending the conclusion of the Presidents' conferences.

The Western lines held a meeting at St. Louis last week, and decided upon a form of agreement which is expected to remedy all existing evils. It is understood that all the southwestern lines except the Missouri, Kansas & Texas are ready to sign. A meeting has been called to be held here to-morrow, at which the executive officers of all the Western lines are expected to be present and consider the advisability of adopting this agreement for the whole territory. Should they agree, it is not probable that the Missouri, Kansas & Texas will stand in the way. It is stated that the new agreement proposes that each line deposit with the chairman a sufficient amount of money to guarantee its good faith, and that any line caught cutting rates is to forfeit to the association all the gross revenue derived from the traffic in question.

Meanwhile, chairman Midgley is making heroic attempts to get the lines to withdraw all unauthorized reductions, and may succeed. The Atchison has agreed to restore hard coal rates to $2 to Kansas City, effective Oct. 13. The Alton proposes, however, to keep the $1 rate in effect until it is assured that a restoration will amount to something.

The Illinois Central having decided to run a series of homeseekers' excursions, the other Western lines have decided to announce two additional excursions this month, with the understanding that the Illinois Central will adhere to the certificate plan on its other excursions. The action is in the nature of a compromise.

Southwestern passenger representatives are hopeful that a new passenger agreement, covering southwestern territory, will be made effective by Oct. 8. If this is accomplished, there will be hope of accomplishing something in the Chicago territory.

Lake rates last week were unchanged and well maintained, as they are likely to be during the remainder of the season.

The Chicago Great Western is considering the advisability of running a tourist sleeper between Minneapolis and Los Angeles via Kansas City and the Santa Fe this winter. A similar service was run last winter by the Chicago, Milwaukee & St. Paul, Iowa Central, Wabash and Santa Fe, which will be continued this winter.

The shipments of eastbound freight, not including live stock, from Chicago, by all the lines for the week ending Sept. 29, amounted to 61,994 tons, against 60,998 tons during the preceding week, an increase of 996 tons, and against 53,850 tons for the corresponding week last year. The proportions carried by each road were:

Roads.	Week to Sept. 29.		Week to Sept. 21.	
	Tons.	p. c.	Tons.	p. c.
Michigan Central	5,874	9.5	5,837	9.6
Wabash	5,810	9.4	5,338	8.7
Lake Shore & Mich. South.	8,803	14.2	8,654	14.2
Pitts., Ft. Wayne & Chicago	7,246	16.7	8,517	14 0
Pitts., Cin., Chi. & St. Louis.	9,330	15.0	9,224	15.0
Baltimore & Ohio	4,201	6.8	4,483	7.4
Chicago & Grand Trunk	7,934	12.8	7,864	12.9
New York, Chic. & St. Louis	4,424	7.1	4,638	7.6
Chicago & Erie	5,839	9.4	4,421	7.3
C., C., C. & St. Louis	2,533	4.0	2,022	3.3
Total	61,994	100.0	60,988	100.0

Traffic Item from the City of Brotherly Love.

In conjunction with the Southern Pacific the Southern Railway is making extensive arrangements to transport the sports from Northern and Eastern cities who desire to witness the Corbett-Fitzsimmons fight at Dallas, Tex. It is proposed to form parties in the different cities sufficiently large to fill an entire Pullman car. These cars will be parked at the fighting grounds in Dallas and be used as hotels. The district passenger agent for the Southern Railway has already gathered a party of 80 in this city.—*Philadelphia Record.*

Governor Culberson, of Texas, intends to prevent the proposed prize fight, if he can; but the railroads are making hay while the sun shines. A Houston paper prints the following anouncement (which, like the foregoing, we have abbreviated somewhat):

The San Antonio & Aransas Pass announces, on account of Robert Fitzsimmons training at Corpus Christi excursion tickets from all stations to Corpus Christi every Friday and Monday. This will enable the people of Texas to see for the first time the great Australian wonder. No man of his class has ever drawn such large crowds. Numerous cities have offered Fitzsimmons large sums of money to train in their midst, but after careful consideration of their climates and other advantages, Corpus Christi was selected as being the most suitable. Tickets $4.50, including one coupon entitling the original purchaser to one free admission to the Fitzsimmons training quarters. Ample accommodation will be provided for all.

On account of James J. Corbett training in San Antonio excursion tickets will be on sale from all stations at one lowest first-class fare with a maximum of $5. Tickets will be sold every Tuesday. They are limited to three days.